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RETROSPECTION.

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To those who have traveled, in a figurative sense, over a considerable distance, enjoying for a long time each detail of the way, and deriving much pleasure and profit and a life's occupation from it; or to those who have labored continuously, arduously, patiently, along a weary and apparently interminable road of life's work, meeting alike disappointment and displeasure, as well as encouragement and enjoyment, making, on the whole, the average of one's experiences, there seems to come a time for retrospection. They are interested to know just how and by what road they have reached the present goal; just as a peculiar thought reaches the brain through a devious, apparently disconnected, way from one far remote, and we are anxious to see by what route we came, how the brain arrived at a place so foreign, apparently, to the thought from which it started.

It is said to be a sure sign of the approach of age when one grows reminiscent. However that may be, the writer, although old in experience and rather young in years, having spent nearly all of the latter in the study and practice of dentistry, hopes that the future will hold for him, by reason of that experience, much that is valuable; much that may be made of value, because of that experience, and that another thirty years of dentistry may be vouchsafed him and be considered all enjoyment or be made so by the application of this past experience.

Within the memory of such an one, dentistry has made many changes; some we might consider profitable, others rather detrimental to the work or to the practitioner himself. On the whole, we cannot doubt but that the practice of dentistry has improved

and advanced greatly, not only for itself, but for dental practitioners and the world at large.

A study for a time, however, will show just where the writer considers that change detrimental or otherwise, and as it must ever be a matter of judgment or one of comparison, it rests upon the opinion or judgment of the readers as to whether the changes, or the modernizing of our profession, is a real benefit or not. All I hope to do is to compare the different steps as they have passed and leave the results for each to figure out for himself.

If we take, first, what might be called the "old-time dentistry" as an example, we shall find that the practice and study of it and the working out of its first principles earned for it one of the greatest blessings and possessions to which any science may lay claim; and that is, that it very surely made "character" for those pioneers, those giants who strove not for themselves, but for their profession, and for posterity. Those early practitioners, like Chapin A. Harris, Wm. H. Atkinson, James E. Garrettson, Morgan, Maynard, Cockerille, Varney, Black and others, who wrought out the principles upon which dentistry was founded, who labored by night, as well as by day, without appliances, except those which they made themselves, materials, too, being at that time almost unknown. These were men of great character, whose heroic works have followed them and shall continue as long as the memory of man lasts. These men worked with only a few rudely shaped instruments of their own patterning; worked without rubber dam, with only soft gold and alloy, or "amalgam," filed from silver coins at the time of using, made their own gutta-percha, and later, their own cement; who knew nothing of the applications of electricity; to whom the discovery of cohesive gold and the invention of the automatic mallet were wonderful. These men had no dental engines, preparing cavities with hand burs and excavation, knew nothing of the advantages of cocain or eucaïn, practiced very little antiseptic treatment and surgical sterilization; had no saliva ejectors. They carved and burned nearly all porcelain teeth used by them; did no soldering of porcelain teeth to metal plates; were obliged to solder, when it was done, with the mouth blowpipe and earlier knew no such thing as suction for artificial dentures. And, so, we might go on almost

indefinitely enumerating inconveniences, blessings in disguise; or, as the great bard tells us, "Adversity, sweet in its uses, which, like the venomous toad, wears, yet, a precious jewel in its head." The precious jewels were the lives and characters of these great men. Facilities came later, in the shape of mallets of mechanical and electrical construction; cohesive gold that made restoration possible, as well as greater durability and beauty (?); rubber dam, with clamps for its retention, together with saliva ejectors, which made it possible to keep a mouth dry for an indefinite time; skilfully designed and wrought instruments of infinite variety for excavation, filling and finishing cavities, also for extraction of teeth.

Methods changed from the wooden pivoted tooth to beautiful Richmond and porcelain crowns, the acme of accuracy in skilful hands. Later the profession grew dissatisfied with troublesome and inaccurate partial dentures and lo! bridge work (shall we throw up our hands in horror?), that boon (?) to the prosthodontist; and how far that bridge reaches, spanning every possible space.

Porcelain fillings, or inlays, as they are technically called, came in due time. But where shall we find a man accurate and skilful enough to "fool" nature with them? Their invisible (?) lines soon grow coarse and ugly; settings, alas! have slipped their moorings and they are brought back to us in the pockets of our victims, *like grains of corn*.

In lieu of the frailty of porcelain for harder usage, we are now "casting" (a base word) our work *and by machinery!* Not only metal fillings, but extended to crowns and really to bridges, those foul, uncertain things.

What sleepless nights are being passed devising methods and "machines" for casting gold inlays. What is it for? may we ask, and where will it end? Is the pendulum about to swing back again? Let us look, if you please, and see what these changes mean upon the characters of those who have practiced them—upon the practice itself—and upon the world at large, those who must suffer that science (or art, shall we say?) may flourish. Character is made in the honest and conscientious striving for good. The less we have of this heaven-born quality, the greater the

necessity for striving. Then it follows, as it always has and always shall, that the greater the striving, the greater the character.

The pioneers of dentistry, like those of this great republic, strove against great need and oppression and wrought out characters to which we point, with equal pride, as to those who built and launched our great "ship of state." Ours the enjoyment, theirs the fame. We shall strive to sustain and improve our bright heritage and pass it on, better than when we received it, and so win our reward.

When a method is simplified, the work loses something. The operator loses something. Often it is the vital spark of success. Work loses at such time the individuality of the operator. I have frequently said that the great secret of Bonwill's success was in the fact that he rubbed or ground a great deal of Bonwill into his work. He worked with an intensity that none could doubt. The latter-day methods are taking away a great deal of that element of individuality from our work. We lose individuality ourselves when we apply somebody's method or machine; our work loses our individuality. And it was this individuality that in former years made our "great men."

Great minds, characters or men are not made by empiricism. They must be wrought out by conscientious, hard work, just as they have always been. And for the work itself—has it the mark of improvement commensurate with our aims and ambitions? Primarily, the office of the dentist is to *save the teeth*. To the most casual observer, who is practicing dentistry, that part of his work (if he is progressive) which is doing most for the preservation of the natural teeth and restoring their function, is the work we call prophylaxis. If we can restore the function and hygienic condition of a diseased tooth or mouth in general, we shall do more toward the saving of teeth than by any other means known to the modern dentist. The more recent practice of scaling the teeth and scientifically treating diseased gums is conducive to the restoration of the mouth and teeth to a normal condition, and does more for their direct preservation, comfort and use or function than all the restorative work we can possibly do, and better fulfils the dentist's mission than all that has gone before.

It behooves him to make the most of this branch of his practice; to develop the skill and patience, together with the study of its pathology, to the highest degré that he may perfect the practice of this most essential branch of his work of saving teeth.

It is a very uncertain question whether bridge work, even at its best, has saved any teeth. It is probably only a tentative method of restoration pending the inauguration of a means whereby those teeth which now are bridged may be saved from loss. While we may be striving for estheticism in porcelain and gold restorations of greater facility, we may be losing much in the work that strong character and individuality might have given it.

The prevailing tendency of the day to obtain greater wealth and possessions without a corresponding outlay of time and labor may have entered the professional ranks of dentistry and the product of the profession may have suffered necessarily because of it.

The effect upon the world at large, upon those who, in the end, must stand for what dentistry provides, who, in other words, must "pay the bill," is by no means the smallest part of our proposition. The public probably never will be sufficiently educated to make intelligent demands upon the profession in the practice of dentistry. The majority, however, have the intelligence to know whether or not the teeth are being preserved or lost. The layman is demanding here, as in nearly all other lines, better and better things, though, in truth, he relies more upon the character of his dentist, and also upon his reputation for skill, than upon an intelligent understanding of what he is to receive in return for the trust and confidence so placed. It is for each practitioner to meet this extra demand and not be found wanting when the test comes. He should be a master and his name to the work be a voucher for its high character, just as the name of Raphael, Rembrandt or Meissonier on a canvas is sufficient to place it within the realm of highest art. Let each work out by toil and conscientious application the reward of having raised the standard a little and having given to dentistry something of his own character, something admirable for those who follow to emulate, something not necessarily making it easier, but rather worthier, their best efforts—thus will dentistry continue to improve and grow.

TIME.

BY J. P. ROOT, D.D.S., KANSAS CITY, MO.

*"Believe me, Time's of monstrous use;
But, Ah! how subject to abuse!
It seems that with him, folks were often cloy'd,
I do pronounce it, Time's a public good,
Just like a youthful beauty—to be woo'd,
Made much of, and be properly enjoy'd."*

—PETER PINDER.

VALUE AND LOSS.

How much do you value your time per minute?

How many minutes a day do you waste? Did you ever figure out your yearly loss of minutes, and dollars and cents?

These questions are worthy of serious thought, but like most business propositions are set aside by the average dentist. The loss of a few minutes' time during each working hour results either in an injustice to yourself or to your patients. If your labors are based on a time basis, the injustice is to your patient, who should not pay for the wasted moments, devoted by you to needlessly searching for misplaced instruments, replacing sandpaper disks on mandrel, by superannuated methods, drying out root canals with a hand syringe, or for wasting precious moments in many other ways. If your labors are charged for by other than on a time basis, the injustice is to yourself, and from a selfish standpoint, if no other, should be remedied.

EXAMPLE.

The most successful temperance exhorter is he who has imbibed too freely, and by quoting his own misdeeds can warn others and keep them in the straight and narrow path; so, having myself spent twenty years wasting time, and five years attempting to correct former bad habits, my experience justifies me in advising others.

SYSTEM.

Establish a system in everything pertaining to your practice; have regular office hours, be they early or late, long or short, and be in your office during those hours. Set aside one or more afternoons a week for relaxation, and relax in whatever form suits your pleasure, whether it be golf, billiards, water sports or any other form

of exercise beneficial to your health, mental and physical. Many of you will condemn this advice as being wrong and extravagant. Consult, therefore, some of your friends who at mature years are compelled to practice their profession daily. I venture to say in most cases they will agree that these hours spent away from the office were not wasted.

EQUIPMENT.

If your office is not equipped with modern labor-saving devices, equip it. You will find from a business, and every conceivable standpoint, that the investment is one far more profitable than buying bonds or corner lots, especially if you buy the gold brick variety of bonds in which most dentists invest. Your patients will give you the credit for being progressive and up-to-date even if you are not, and as most of our business results from the free advertising of satisfied patients, they will be more than ever prone to talk for you after seeing new evidences of your advancement.

LABOR AND TIME SAVERS.

Let us note a few devices which are time savers, labor savers and a comfort both to yourself and patient. Compressed air at the chair you may consider a luxury—use it and it soon becomes a necessity. As a chip blower it is instantaneous; as a means of spraying an aromatic, antiseptic solution on all surfaces of oral cavity before and after an operation, it is both pleasant and helpful; for injecting solutions into deep pockets in the treatment of pyorrhea, it is invaluable; for driving away the saliva at same time drying and keeping dry the tooth structure for a crown or bridge in the lower jaw, it is a wonderful aid. In connection with an electric heater for drying root canals preparatory to filling, for cooling modeling compound when used for purposes of impressions; with these and other uses, the busy dentist not only lessens his own labors but adds to his patients' comfort, and the time saved, when calculated in dollars and cents, will soon pay the cost of installing.

An electric annealer, with which you can anneal sufficient gold at one time for an operation, speaks for itself when you stop to count up the wasted moments used in annealing with gas or alcohol. An electric mouth lamp to find inaccessible, approximal cavities; its bright rays penetrate the tooth structure and bring to your vision any flaws existing, saving needless probing with explorers. The

uncertainty as to whether a tooth is alive or dead is soon relieved by these same rays.

An electric water heater, so there is always a syringeful of tepid water for immediate use.

REGARDING INSTRUMENTS.

Have the required number, and a convenient drawer for each set, and a certain place for every instrument; and when put away by yourself or assistant, be trained to place each instrument where it belongs, so you can reach for and find it without even glancing at receptacle. A good system, especially appreciated when training a new assistant, is to have each set of instruments with a different form and style of handle, then the liability of chisels and pluggers being mixed is greatly lessened.

You may and should buy your burs by the gross, but you do not need a gross in sight. You can only use one at a time, and that one should be sharp, so as to ensure always having the proper bur and not having to waste time hunting for a suitable one. Have a receptacle for burs only holding one of a kind, and when one becomes dulled throw away and replace with a new one.

I use sandpaper disks for many purposes, such as polishing fillings, preparing cavities, finishing crowns, cutting away tooth structure for crowns, etc., etc.; and I desire all sizes and grits. Formerly I followed the popular method of dumping a few hundred in a drawer and playing hide and seek with them each time one was needed, and then probably used a No. 6 disk on a No. 2 cavity. After wasting a few years of my sweet, young life at this sport, I reformed and now there is a compartment for each size and grit. The frequent use of a sandpaper disk results in the frequent placing of new ones on a mandrel. Do you reverse your engine to remove screw? If so quit, as Dr. Moore invented a delightful disk which is "off and on again" sooner than you could begin to swear because the screw in old-fashioned mandrel was stuck. While arranging the compartments for disks, notice whether your strips are tangled up in a mass like a bunch of angle worms or are methodically laid out, each size and grit by itself.

Do you use guttapercha points? Do you use more than one size? Do you keep them all together? I wager that you do.

THE MEDICINE CASE.

The medicine case in the average dentist's office serves the same purpose as does the attic in the old family homestead. It is the storing place for disused, antiquated, useless plunder. Medicinal treatment in a limited way is called for in dentistry, and a few medicinal preparations are necessary, and only a few. These should be on a shelf, one bottle deep, so as to be immediately visible and reachable. To obtain this a wall case only deep enough for one row of bottles is advisable. Keep your few steady friends there, and relegate the surplus sent to you by manufacturers to the laboratory or your neighbors.

With the present extensive use of cements, the same rule applies regarding space on shelf—have each kind in plain sight, with labels out, and it is there when needed.

APPOINTMENTS.

Some of our braggadocio friends display with pride their appointments for weeks ahead. Any busy dentist, if so foolish, could do the same, but do you conserve time by so doing? Do you have vacant hours for emergencies, such as out-of-town patients, or those who must "eat and run" in making an appointment? Plan ahead as near as possible just what operation you desire for that setting, estimate the required time, then no time is lost on your part by waiting for your next patient, nor need your next patient wait for you. Many operations require preliminary separation of the teeth. This should be attended to in time, so at subsequent sittings one or more will be ready and no delay ensue. This same rule applies regarding the finishing of an amalgam filling (if you finish them) or a gold inlay; plan so that the patient need not return for this operation alone.

THE ASSISTANT.

A well-trained assistant is the greatest of labor-saving devices, and as rare as great; if great she must be above the average in intelligence, and if so, some appreciative young man annexes her for life, or she advances to a higher and more remunerative sphere, so as a time saver will not consider the greatest of time savers, as she is too rare a species for the ordinary mortal.

But if you are lucky enough to obtain and retain such a blessing, one who can make your appointments, keep your books, mix your cements and amalgam, bake your porcelain, invest and run your

cast gold inlays, besides doing a multitude of other things, then you are twice blessed, and all other labor and time-saving devices, modes and methods combined are not equal to her.

A DIFFERENCE.

The question of time wasted and time saved is looked at in different ways by different people. Some people keep their instrument case on opposite side of the chair for the sake of the exercise they have in walking back and forth; they give their patients a rest while they are on pedestrian tours, or a search expedition after misplaced instruments. My theory is, the sooner a patient leaves my chair the better he or she is pleased, and any breathing spell I may give them is spent in wondering "What will he do next," so for my patient's comfort rapidity on my part is a pleasure to them, and for my own comfort, if I can save ten minutes or sixty in one day, those precious moments can be very profitably utilized by just that much longer morning nap. While I believe every man has the privilege of running his own business to suit himself, yet it seems foolish for him to waste valuable time by lack of system, and this is due largely to lack of thought upon the question. My object in presenting this subject is not for the purpose of getting my name in print, or to provoke discussion, I simply am acting as a philanthropist for other lazy men, and aiding them to work less and sleep more.

PRACTICE BUILDING.

BY H. L. DICKINSON, ALTON, ILL. READ BEFORE THE MADISON COUNTY DISTRICT DENTAL SOCIETY, NOVEMBER, 1907.

There are landmarks denoting boundary lines of the different epochs in every man's life, the passing of which may well be, to him, a time for thoughtful introspection. A mental taking stock of himself, as it were, and careful consideration of those things which have contributed to the upbuilding and advancement of his work in life, and those contrary things which have retarded.

So, in the closing days of my first decade in the practice of the profession, I have been looking backward philosophizing to some extent. To many of those present today, ten years represents a comparatively small period of practice, and to such, richer in ex-

perience as they are than myself, it may appear presumptuous in me to attempt the presentation of any such subject as this.

At the outset I disclaim any idea of trying to give advice or instruction, believing that the experience of one man at the outset of his professional career is largely that of all. I simply desire to present to you some conclusions I have formed regarding the problems confronting the younger practitioner at a closer viewpoint than have you, whom the years have carried further away from the struggles of earlier practice.

The young man entering the practice of his profession, fresh from the influences of college, where he has laid the foundations for that profession, usually is inspired with the right ideals. There is no question in his mind as to the place he desires to occupy. It is to be one of honorable standing in his community and of regard and esteem among his fellow practitioners.

His conception of what constitutes success, however, will likely be subject to change. The vicissitudes of early practice will either crystallize in him a broad conception of success for the future, based upon results accruing from persistent, painstaking daily effort, or will narrow his conception and limit his possibilities by keeping his eyes glued on present conditions of his financial barometer, thus getting out of harmony with the line of conduct necessary to the attainment of his ideals.

And it is pretty hard to keep from doing this in those first lean years of practice. Often there is a close connection between the incoming and outgoing trains of his finances, and, besides, he has to reckon with the natural impatience of youth. He sees the advertiser filling his office with patients, and obtaining quickly those monetary results for which he longs, and he is tempted. He argues with himself that providing he lives up to his promises, it is just as legitimate for him to advertise his abilities as for the merchant his wares.

He tries to persuade himself that the fakir has usurped a field which could be retrieved from its odium by the right methods of honorable practice. But the sophistry of this line of argument, I have come to believe, lies in the fact that the advertising man has attempted to commercialize a kind of human endeavor which in its very nature is individualistic, and incapable of expansion.

It is utterly impossible to fill your office through the medium of advertising and render to the patients thus secured the careful service that successful dental operations demand, nor is it possible to advantageously enlarge your capacity through the hiring of men to assist you, for you cannot expect, and, in fact, never will get, the conscientious regard for detail essential to legitimate professional growth. It is almost impossible for successful partnership in dentistry even, for it is seldom indeed that the same skill and ideals, working harmoniously, can be cemented together in this line of work. And it is true that a dental firm has got to stand or fall upon the collective merit of the work of all its members, rather than the efforts of its component parts. Granted the correctness of these conclusions, it follows that the young man should early eliminate from his consideration, as a method of practice building, the idea of advertising, not alone from the ethical standpoint, but because impractical and antagonistic to real, lasting success from every standpoint. I am firmly convinced that through the growth of knowledge among the laity relative to the right kind of dental service required will ultimately come the elimination of the advertiser. I am not going to tax your patience nor take your time by going into the consideration of everything contributive to this result. We could dwell on numerous qualities, such as courtesy, fairness, enthusiasm in our work, etc., which while important are no more germane to achievement in dentistry than in other callings.

I believe the thing that counts, that which is the cause to the effect of success, is the realization that "we build the ladder by which we rise, from the lowly earth to the vaulted skies," and so, realizing persistently, day by day, put into every operation the best thought and skill there is in us. If this be the motive thought which animates us, we will have no time to "knock" the other fellow. The only use for the hammer in dentistry, anyway, is to mallet gold, and he who tries to use it otherwise finds it a boomerang that hits him last and hardest.

So, as the years go on, I think we have demonstrated to us that according as we hew true to the line of professional conduct will be our value to ourselves and to our community; and that our rewards will be in pretty exact ratio to the service we render.

A CONSERVATIVE AND PREVENTIVE PULP TREATMENT.

BY BESSIE BURNS BENNETT, D.D.S., BALTIMORE, MD.

In treating diseases of the dental pulp, speaking more especially of exposure, be it accidental, the result of caries accompanied by pain or otherwise, many things must be taken into consideration.

First, the case must be treated with as much comfort to the patient as possible during the operation. Second, and of even more importance, the case must be so treated that the after-comfort of the patient may be assured and that the operation may be as nearly permanent as possible; for we cannot resist the fact that it is a fact that the distress of the patient often tempts us to short methods which may bring serious after-trouble for the patient we would guard, and likewise ourselves.

What can occasion greater distress than a metal filling directly over a pulp having no protection save from a thin layer of dentin? The slightest thermal change is transmitted to the suffering organ by means of that most excellent conductor, the metal filling; and if the irritation continues (some patients will stand the pain thinking it temporary) congestion follows—inflammation, decomposition and pus formation—the gaseous results of the decomposition find their way through the apical foramen into the apical space, and we have a deep-seated alveolar abscess, which may not only be local in its effect but the cause of general constitutional disorder.

What should be done in cases of recent or accidental exposure—exposure of long standing—the organ possessing high vitality, yet having shown its susceptibility to irritation by acute pulpitis?

Ah! with Hamlet we would say, "To be, or not to be; aye, there's the rub."

If the pulp is allowed "to be" after involvements may occur; if it is a case of "not to be," and the devitalization of the organ be accomplished, ever so carefully, and the canals filled even more carefully, there is still the possibility of the inevitable abscess to be faced.

It seems to me that the consensus of opinion lies toward the conservative treatment of the pulp, if necessary extirpating a portion, then applying a capping of some well-tried antiseptic material, which must be a non-conductor; a temporary crown filling for awhile, when the tooth behaving itself seemly, a permanent filling is inserted.

The use of the counter-irritant upon the gum margin must not be forgotten.

I wonder if all of us know just why we use counter-irritants, and why the mustard foot-bath is prescribed in cases of severe alveolar abscess!

Speaking of alveolar abscess it would not be amiss to impress upon our minds a very simple remedy which often yields a world of relief to the sufferer. Patients afflicted with alveolar abscess, or, in fact, most of the pericemental disorders, report that the pain always increases at night upon assuming the recumbent position. The cause of this is naturally an increased blood supply, the head being on the body level; for relief, direct the patient to arrange the pillows so that the body will be in a half-sitting posture, the head held in the same position as when standing, and the increase in pain will pass away.

However, the point now in question is not the treatment or alleviation of alveolar abscess but a preventive method.

What safeguards are necessary for this prevention?

First, the pulp must be free from all traces of decomposition; second, the organ must be kept quiescent, must be guarded from all outer irritants; third, should an irritation be brought to the pulp through the circulation, enter it and destroy its vitality, or should the vitality of the individual be not sufficient to assist the pulp in withstanding the shock of some previous infection, there must be some safeguard whereby the products of death may be prevented from becoming putrefactive.

Special stress must be laid on the preventive method, for, though the cavity be cleansed and sterilized thoroughly and the pulp capping be applied so skilfully that there can be no danger from infection or irritation, still, irritation, I repeat, irritation may be brought within the pulp through the circulation, and the blood supply being generous (though the means of ingress and egress is constricted), when irritation continues and congestion ensues, death of the pulp will most likely occur from strangulation, and if no antiseptic or antifermentative be present, fermentation and putrefaction will be the natural result.

The question is, can this be done; can a lining, capping or filling of such characteristics be used that it will at once act as an obtund-

ent, non-conductor, and in the possible death of the pulp, powerful antiseptic?

It is my belief that it can. The method I am about to exploit has been in use by me for nearly four years, and without exception has proven a success—not to always conserve the pulp, but even in the presence of the death of that organ no destructive abscess formation has followed.

The need for a material of this character presented itself to me in connection with a patient who had just passed through a severe operation, was exceedingly nervous, the tone of the system being very low, and the simplest operations were magnified by her apprehension into tortures. The teeth were in a very bad condition, the ordeal having been put off from time to time until it was absolutely impossible to wait any longer. Nearly every tooth affected presented an approximate or actual exposure of the pulp.

I was doubtful of the use of arsenic as a devitalizing agent on account of the possible pain, and the use of cocain was out of the question, as the rubber dam could not be used because the patient became nauseated for one reason, from the dam, and could not keep her mouth open more than a few minutes at a time for the same reason, of nausea. It was my desire, if possible, to save most of the pulps, so like Poe, in "The Raven," I pondered.

Necessity has ever been the mother of invention, so necessity evolved from the chaotic amount of knowledge whirling at random through the labyrinths of my brain the following facts: Zinc oxid forms an excellent basis for solid or semi-plastic mixtures, the character of the resultant mass depending upon the vehicle. Oil of cloves is one of the best obtundents; also possesses antiseptic qualities in the latter connection. Indeed, it is even better than phenol, for it is a known fact that oil of cloves (as, indeed, do all the essential oils) deposits a sort of film over the surface, which film remains long after the drug itself has become volatilized; whereas, phenol has ceased its usefulness as soon as it has become absorbed. The third fact evolved was that iodoform, or its modification, aristol, is a powerful antiseptic and anti-fermentative, and used while the tissue is free from any putrefactive germs will preserve it for an indefinite period.

So my triple formula was promulgated—a mixture of zinc oxid,

oil of cloves and aristol—the first used merely as a basis; the second, the adjuvant, to soothe the weary pulp and banish the thoughts of odontalgia, while the third would cause all disquieting thoughts of alveolar abscess “to fold their tents like the Arabs and silently steal away.”

It was built upon the old Latin maxim, “*Cito, tuto, et jocunde.*”

The aristol, being odorless, was used in preference to iodoform, on account of the objectionable odor of the latter, which always calls to my mind the surgical ward of a hospital.

Take into consideration what a boon it is to an extremely nervous patient, or one recovering from the effects of a long illness, to have a capping of this sort applied; then the regular filling, rather than spend several hours in the chair undergoing devitalization, cleansing and filling of canals and then the final crown filling; especially when it can be done with such peace of mind for the operator, for there is not a whit more danger in this method than there would be after the most careful devitalization, sterilization and subsequent filling of canals and crown.

It must be remembered, however, should there be decomposition of part of the pulp, all this portion must be extirpated and the remainder thoroughly sterilized before the application of the aristol preparation, as none of the drugs are germicides—merely antiseptics and anti-fermentatives.

To prove that the preparation does prevent decomposition, I will cite two cases:

One a lower bicuspid. This patient was going away immediately and there was not time to properly treat the tooth which had given serious trouble, the pulp being exposed. I applied the aristol preparation, covering it with a temporary filling. After being away several months, she broke the tooth off and had a porcelain crown attached. That the pulp had died was evidenced by the fact that the operator immediately proceeded to place the crown in position, the entire operation being done in one sitting and no pain present; nor had the tooth given any trouble whatever in the interval.

The other case was of an upper molar, the outer wall having been broken off by the patient, thereby loosening the filling. The same course of events was apparent here; the pulp which had given great trouble before filling had died, but everything was clean and aseptic.

That the entire tooth is impregnated with the mixture, I am positive, for after the capping has been in place some time, if the filling be removed, the odor of the aristol and oil of cloves, which mixture has an individual odor, will be as fresh as though it had just been placed, and cement covering it is also impregnated.

The method of procedure is as follows: Take one part aristol to three parts zinc oxid, sufficient oil of cloves to mix into a mass of a thick clay-like consistency. A pellet is placed over the pulp and placed into position gently with a round-end amalgam instrument, care being taken to keep the edges of the cavity free. If the mixture becomes dry from the volatilization of the oil of cloves, all that is necessary is to add sufficient oil from time to time to keep it in a semi-plastic condition.

ON PREPARING DENTAL PAPERS.—In preparing papers, if we have invented, observed closely, investigated, or thought deeply, we are not at a loss for a subject. If we are not delvers, choosing a subject may be comparatively difficult; yet, if we go about it earnestly, we can, with a due sense of our limitations, find something in our experience at the chair, or in the laboratory, or in our observation of matters connected with the abstract relations of dentistry, that, although not of striking importance, may still be interesting and of profit to some if not all of our hearers and readers. We should consider that even small increments have their place in the progressive building of our art and science.

The material, composed of original observations and of jottings while reading up, should be fitted to place in a synoptic scheme based on logical sequence of thought.

In the treatment of the subject so far as words are concerned there should be accuracy—that is, they should leave no doubt as to the author's meaning, and should conform as nearly as may be to accepted terminology: In *appropriateness* they should be consistent with the thought and subject, preference being given to the familiar and simple, though, if these are not adequate, classically derived forms should unhesitatingly be used; and for *copiousness*, not wordiness, but resourceful variety. As to construction there should be *clearness*—that is, precise, forcible presentment, with one prominent thought to a sentence and not too elaborate a predicate; and *conciseness*—that is, direct statement, avoiding "tedious dilution of thought" and tiring minuteness of detail.

Finally, it may be said that as the purpose of writing is to communicate thought, this should be accomplished in the most effective manner. Our style should neither be stiff to starchiness, nor be limp to slouchiness; it should combine simple dignity with clearness, force and ease.—L. C. F. HUGO, *Dental Cosmos*.

Digests.

A PERSPECTIVE VIEW OF CROWN AND BRIDGE WORK. By Hart J. Goslee, D.D.S., Chicago, Ill. In the evolution of the specialty of crown and bridge work the enthusiasm and ingenuity of the profession have resulted in the presentation of a myriad of methods. These encompass so varied a field that the practice in this particular line of work has always been more or less empirical, and, to a large extent, it still so remains.

This is evidenced by the fact that for many years each issue of our journals has teemed with the individual methods of those who had the ability or temerity to write, until he who is eager to keep pace with the progress of the day is now confronted by a bewildering array of procedures. Many of these have possessed, and do possess, merit. Others have proven to be invaluable. Those which have not stood the test of average practicability have soon been abandoned, and yet, all have contributed more or less to the wonderful progress of this specialty, and in turn of dentistry as a whole.

While the mental armamentarium of the modern practitioner should embrace a reasonable familiarity with all of those methods which may even possibly be useful, yet the time has arrived when we should begin to systematize our work so as to abandon the obsolete, relegate the indifferent, and improve the really practical.

If this were done to-day, I prophesy that it would be surprising how many of the procedures now in more or less common use might well be consigned to the garret of the past, and how comparatively few we could get along with. Indeed, I am forced to predict that the practice of the future will embrace but a small proportion of our present numerous methods, and that even then our efforts will be more successful, and our results better.

In this, however, I do not mean to infer that any one specific system, or particular method, will ever be universally applicable to the varying conditions which confront us, nor that any distinctive line of procedure can invariably be followed, but I do believe that the status of our development at the present time indicates that we could do better work with fewer methods, if we would but recognize the possibilities of the present, and use good judgment in their application.

If there is one thing above another which is needed, however, to rescue this important specialty from the empiricism of the past, and to place it upon a sound, practical, and scientific basis, it is a better knowledge of its underlying mechanical and dynamic principles, and a better appreciation of the essential requirements incident to the work which we attempt to accomplish. Indeed, we can not hope to use good judgment until these are acquired.

As an evidence of the fact that good judgment does not always dominate the operator who essays to do crown and bridge work, let me briefly call your attention to a few of the many questions which still remain unsolved, and regarding which the profession is even now woefully divided.

First, for example, should the pulps in teeth which are to support artificial crowns be devitalized as a procedure incident to the preparation of such teeth, or not? Second, should a crown be made with a band, or without? Third, should a band, when one is used, extend beneath the gum margin, or not? Fourth, should we destroy or mutilate the beautiful crown of a sound tooth for the purpose of obtaining support for a bridge, or not? Fifth, if this is not warrantable, should we use an open-face crown, a so-called "hood" or "groove" attachment, or some other method? And, sixth, should we use a "fixed" or a "removable" structure in the building of our bridges?

If dentistry is a scientific profession, and if it has progressed and developed with the marvelous rapidity with which it has been accredited, does it seem reasonable that such apparently simple and practical questions should remain unsolved?

While it is quite beyond the pale of human reason to expect that any scientific body should agree on all things, or that all would be unanimous in their deductions and conclusions, yet it is not at all unreasonable to expect a solution of these more or less fundamental propositions. There must be a right way and a wrong way, and in these instances one or the other must be right or wrong, in a large proportion, or, at least, in a majority of cases, and that procedure which is best in a majority of cases is the proper procedure in a very large proportion.

By way of analysis, the question of devitalizing the pulp of a tooth which is to be crowned is not one of professional equation,

nor one which should be decided by the pet hobby of any man, but is simply a question of, first, whether it may be placed in a condition which will be most favorable to its comfort and longevity unless this is done. If such a tooth can be prepared from a mechanical aspect so as to admit of the accurate adjustment of an artificial crown, and if such preparation does not seem to endanger the vitality of the pulp, then to devitalize this organ would perhaps be unnecessary, and consequently wrong, but unless this may be done, and done in a thorough and conscientious manner—*which is seldom possible*—then devitalization becomes an absolute necessity, and must be resorted to whether we believe in it or not.

The same may also be said of the question as to the advisability of making a crown with or without a band. In this instance the point is not so much whether we believe in a band or not, but is a question of the physiologic and mechanical requirements of the crown which the root is to support. These combined demand a union between crown and root which will afford a minimum of irritation and a maximum of strength. If such composite requirements may be obtained to the best advantage without a band, then the use of one is unnecessary, and therefore objectionable; but if the presence of a band will afford a better adaptation of the crown to both the *base* and *periphery* of the root, thereby minimizing the possibilities of irritation, and carrying the joint to a more immune area, thus better protecting the mounting medium, which its proper adaptation has usually heretofore afforded, then such a type of construction is not only indicated, but demanded as a practice.

The question as to whether we may or may not be warranted in sacrificing or mutilating the crown of a sound tooth for the purpose of obtaining support for missing teeth, should not be one of personal preference and can only resolve itself into, first, whether a fixed structure would be the best means of supplying the missing teeth or not; and, second, whether an artificial crown would afford the best and most permanent means of obtaining attachment to that tooth.

Until the present time an artificial crown has seemed to offer the best means of obtaining such attachment in the most artistic and permanent manner, for the reason that a better adaptation between it and the supporting tooth could be effected, than was so universally

possible by any other means at our command. Previous to the successful application of inlay work this was true, because most, if not all, of our former methods were so difficult to adapt with any degree of accuracy that they could only be considered as being of a more or less temporary character, and since a remaining natural crown was thus saved—only to be subsequently lost—such a procedure was often warrantable, and would be so to-day under the same conditions.

The same general line of thought is also applicable to the question as to whether a fixed or a removable bridge should be used when missing teeth must be supplied. This, however, need no longer be considered a problem, but rather a simple matter of judgment on the part of the operator, for there are distinctive indications and contraindications for the use of each.

If the position and stability of the teeth which remain, and which may be used to support the structure supplying the missing teeth, are favorable and adequate to the mechanical or dynamic requirements of a fixed structure, then such a type of construction is *indicated*, but in all cases where this may be at all doubtful, then a "removable" piece is *demande*d. Hence the success of the procedure will depend not so much upon the selection made from the vast array of methods at our command, but, on the contrary, must rest more or less entirely upon the appreciation of mechanics exercised by the operator. Indeed, my sympathy goes out to him in whom this faculty is not developed, and to his patients also when he essays to do dental bridge work.

Such an analysis of these so-called problems leads us to the conclusion that they are not questions of principles, but rather of judgment. Therefore, it behooves us to cultivate and develop this attribute to a higher degree if we would hope to aid in placing this specialty on a broader scientific and less empirical plane.

If this degree of judgment prevails, first, in the application of correct principles, and, second, in the selection of methods of procedure, let me again prophesy that we will find ourselves discarding old methods, if indeed we have not already done so, and using even a lesser number of the new ones, and the practice of crown and bridge work will therefore become practically revolutionized.

If the logic of such a statement is questioned let me say that it

has been made possible largely by the advent of gold inlays and their assured usefulness, and particularly by the splendid achievements of Dr. W. H. Taggart of Chicago, in the line of successfully casting gold and other metals, and for this reason to him, more than to anyone else, is due the credit for this revolution in our methods.

Accuracy of adaptation has always been and must always be the keystone of the arch in the successful application of crowns and bridges, and since this is now possible to a wonderful degree—to a degree never before achieved—and since it is applicable to crown and bridge work as well as to the filling of teeth, what must be the possibilities? Indeed, they seem unlimited. But even granting that such accuracy is to be obtained by the casting of metal, why does it follow that our methods are to be revolutionized by this process?

For answer let me say that a multitude of teeth which were formerly crowned for the purpose of effecting their individual restoration may now be successfully and permanently filled, and that the principal source of irritation and consequent discomfiture resulting from crown work in general will be thereby avoided.

Also, that many natural crowns of teeth which would otherwise be sacrificed for the purpose of obtaining anchorage for bridge work by the substitution of an artificial one, will be saved, and, furthermore, that the assured success of a well-adapted gold inlay, and the possibilities of obtaining such adaptation in all cases, will cause it ultimately to supersede other methods of obtaining anchorage or attachment to the crowns of remaining natural teeth.

In addition to this, it will enable us to adapt *accurately fitting metal bases* to the roots of teeth which are within the range of vision, and to use the various forms of replaceable porcelain crowns of teeth, instead of the ordinary pin facings, thus disposing of the question as to whether to use a band or not by removing the objections to one, and eliminating the element of inherent weakness caused by the presence of platinum pins in porcelain facings and giving us a combination of beauty and strength not to be obtained in a so-called "Richmond" or even in the more modern type of porcelain crown.

It will also enable us to successfully use replaceable porcelain teeth for dummies for bridge work, in the posterior as well as in the anterior part of the mouth, thus improving upon former methods involving simple pin facings, usually of poor form or doubtful color,

and a more or less conspicuous display of gold incisal edges and occlusal surfaces, and greatly diminishing the frequency of broken facings both in soldering and in mastication.

In this connection the heating of porcelain facings for the purpose of soldering, and their attachment to the metal structure by this means, has always been recognized as a more or less doubtful, if not dangerous procedure, and as constituting an element of weakness in the finished piece. Both of these objectionable features, however, may be overcome or entirely eliminated by the strong assemblage of the metal parts only and the subsequent attachment of the porcelain to them by means of cementation, and as such an attachment is equally secure, and manifestly safer than the more rigid and unyielding one resulting from soldering, and as opportunity for replacement in the event of accident is always present and favorable, it must ultimately become recognized as the preferable procedure, and adopted as the general practice.

These possibilities will also enable us to construct bridges of any size with a minimum of solder and a maximum of strength, and to obtain all of the cosmetic advantages and none of the doubtful and objectionable features of porcelain bridge work.

Thus, also, in these enlightened and progressive days, when the leading minds of the profession are directed towards prophylaxis, will the *art* side of dentistry contribute to this splendid and growing cause by making possible the construction and application of better fitting and hence more "prophylactic" crowns and bridges.

Again, venturing a prophecy for the future, let me suggest what I think will be the composite of typical and ideal methods.

For single crowns the all-porcelain, hollow, or "jacket" crown is undoubtedly one of the most practical and cosmetic means of restoring the anterior teeth, and while it will probably come into more general use than it is at present, still the high order of skill required, and the fact that such a type of construction is not universally applicable, will necessarily limit the field of its usefulness.

The use of replaceable porcelain teeth without platinum pins, to be subsequently attached by cement, for individual crowns and also for dummies, or substitute for the natural teeth in bridge work, must be considered as the solution of the problem of discolored and fractured facings, for the reasons mentioned, and hence is undoubtedly

destined to become the practice of the future as soon as we can prevail upon the manufacturers to supply our wants and needs in this direction.

With porcelain teeth suitable for this purpose—and we will get them some day—we will thus have two general types of construction for single crowns; types which will embrace a field more or less universal in application and general usefulness, for all teeth within the range of vision. Combine these with the ordinary gold shell crown made to fit and to occlude properly, and applied to teeth so removed from the range of vision as to eliminate any objections from a cosmetic view-point, and we find a limited number of types, with an almost unlimited range of application.

Having also one general type of dummy for bridge work which will be equally practical, esthetic and applicable in the construction of dental bridges, then we will need but to consider what shall be the type of attachment to the supporting teeth, and I am of the opinion that three general types will ultimately answer our purposes in a very large majority of cases. The replaceable porcelain crown with cast base for anterior roots, where the substitution of the entire crown is indicated; the gold telescope crown for posterior roots, where crowning is demanded, and the inlay where all or even a sufficient portion of the crown of the natural tooth remains, and these attachments are equally applicable to "removable" as well as to "fixed" structures.

Thus may the construction of crown and bridge work be revolutionized, and, therefore, since we have these splendid possibilities ahead of us, must its practice become less empirical and more systematic, practical, cosmetic, and successful.—*Items of Interest.*

SOME THOUGHTS ON MALIGNANT GROWTHS OF THE MOUTH AND LIPS. By George G. Ross, M.D., Philadelphia. The oral cavity and its accessory organs is a not uncommon location for cancer. It has been variously estimated that one-seventh to one-third of all the cancerous growths are located on the face or in the mouth. The prominence of the growth and distressing symptoms in the late stages make cancer of this location particularly unpleasant, uncomfortable and often agonizing.

The horrible, unyielding sore on the lips, the foul-smelling, dis-

charging growth on the tongue or buccal surfaces, with saliva and pus running from the mouth, make a truly pathetic picture.

The general health of these unfortunates rapidly becomes undermined from the inability to properly masticate food and from the associated infection of the stomach due to the constant swallowing of detritus and toxins. When we consider the symptoms and associate them with the essential fatality, we can well afford to match all our skill and knowledge in doing battle with this terrible affliction.

The three varieties of malignant growths met with in the mouth and lips are, epithelioma, carcinoma and sarcoma. The latter is usually found in the bones of the jaws or the periosteum and will, therefore, not be given place in this paper.

Epithelioma is the form of malignant growths most commonly met with in the mouth and lips. The lips are a very common site; the lower lip much more frequently than the upper. Trendelenburg found that in 499 cancers of the face 241 were of the lower lip.

Cancer of the oral cavity is far more common in the male. Among 1,000 cancer cases in women only 13 were affected on the lower lips, oral cavity or tongue. Eight on the lip, 3 on the tongue, 2 in other parts of the mouth. Two hundred and forty-three of these cases had mammary carcinoma; of 1,000 cases in men, 111 occurred in the oral cavity; of these, 66 were on the lips, 21 on the tongue and 13 on other parts of the oral mucous membrane.

Age is a distinct factor in cancer of the face and mouth. The predisposition increases with advancing years, being especially marked between the ages of forty and sixty.

Sex has a most marked effect, or to speak more accurately, the habits of sex. Men in whom smoking is almost universal, and drinking of alcohol very common, are more prone to the disease than women.

There seems to be no definite knowledge as to the contagiousness of malignant growths. There are several cases on record where there was some evidence of the transmission of malignant growth of the lip to another and presumably normal individual. This evidence is not to be accepted as in any way conclusive or

definite. I do not believe from our present knowledge of the subject that malignant growths are contagious.

Any source of irritation which is prolonged and active is an important etiologic factor in the production of the disease. Smoking, and particularly pipe smoking, rough and sharp-pointed teeth, teeth which are not closely coaptated, constant biting of the cheek or tongue, are all predisposing factors of importance. Leucoplakia is probably the most common predisposing cause of oral cancer.

"This term, as first used by Schwimmer, is applied to an idiopathic disease characterized by the gradual development and extension of opaque, milk-white patches on the mucous membrane of the cheeks, lips and palate, but most frequently on the upper surface of the tongue, where they may extend as far back as the circumvallate papillæ. On the mucous membrane of the cheek they are arranged in mosaic fashion, are small, and scarcely project above the surrounding level. A similar condition is found on the lips, the gums and the palate. On the tongue, however, they gave the impression of a thin rind only a few millimeters in thickness, applied to the upper surface, at first smooth, but later wrinkled and furrowed. Some of these furrows are ulcerated and penetrate more or less deeply into the mucous membrane. These patches, whatever their site, are sharply marked, but of irregular contour, and are often compared in appearance to a map. The edges may become closely approximated, and in certain places the patches are confluent. In this manner the entire upper surface of the tongue may be covered with white flakes of varying thickness. Palpation shows that these patches are hard, and in advanced conditions they feel like roughened, horny plates. The furrows and the ulcerated areas are very apt to bleed at times."

A very important point in the pathology of carcinoma of the lips and oral cavity, and one which is not generally recognized, is the associated infection of the involved area. When one considers the fact that the oral cavity offers all the favorable conditions for the growth of bacteria, and as bacteria exist in the mouth under normal conditions, we can understand how they will grow and multiply under abnormal conditions of cancer growth. I

believe that a great deal of the early pain and enlargement of the cervical lymphatics is due to the associated infection. Later the enlargement of the glands is due to metastasis. I also believe that the inflammatory involvement of the glands favors early metastasis.

Involvement of the cervical lymphatics is of so great importance in the prognosis of the disease that I will describe their anatomy at the risk of being somewhat tiresome.

It is of little use to remove the primary growth, and leave involved lymphatics. And it is here that the X-ray treatment of cancer falls short of being a complete surgical procedure. It should be limited to the local stage of the disease.

"The superficial cervical glands are composed of two groups, the external jugular and the superficial anterior cervical glands.

"The external jugular glands are superficial to the sternocleidomastoid muscle. They are four to six in number and lie along the external jugular vein upon the outer surface of the deep cervical fascia. The sternocleidomastoid muscle is beneath them. They are usually gathered in a group a little below the parotid gland, but sometimes extend to the middle of the vein. They receive vessels from the occipital, the posterior auricular, the parotid, and the submaxillary lymph glands, from the auricle, and from the skin and subcutaneous structures of the neck. From them lymphatic vessels pass to the upper deep cervical and to the lower deep cervical glands.

"The superficial anterior cervical glands lie along the anterior jugular vein, and from them vessels pass to the deep cervical glands.

"The submaxillary glands are in the submaxillary triangle beneath the deep fascia. They number three to six, are imbedded in the superficial surface of the sheath of the submaxillary gland, but are not found within the sheath. Occasionally one or two are found in the deep portion of the sheath toward the floor of the mouth. The middle gland of Stahr is situated at the point where the submaxillary group is crossed by the facial artery. This is the largest gland of the group. The submaxillary glands receive vessels from the nose, the cheek, the upper lip and the external part of the lower lip, almost the whole of the gums and the anterior third of the lateral border of the tongue. They also obtain

lymph from the floor of the mouth and from the sublingual and submaxillary salivary glands. They send vessels to the jugular and to the upper deep cervical glands.

"The submental of median suprahyoid glands are situated between the anterior bellies of the two digastric muscles and upon the mylohyoid muscle. They receive lymph from the cutaneous surface of the chin, from the cutaneous and mucous surfaces of the central portion of the lower lip, from the central portions of the gums, from the floor of the mouth and from the tip of the tongue. They send some vessels to the submaxillary lymph glands, and frequently a gland is interposed on the anterior belly of the digastric muscle. They send other vessels to the upper deep cervical glands." (Gray's Anatomy.)

In a series of thirty-six cases in the German Hospital in the past five years the location of the growth was as follows: Lips 14, tongue 12, cheek 7, tongue, lip and cheek 1; tongue, tonsils and fauces 1; lip and cheek 1.

Of the fourteen lip growths twelve were epithelioma and two carcinoma. Of the twelve tongue growths eight were carcinoma and four epithelioma. Of the seven cheek growths five were epithelioma and two carcinoma.

The growth of the tongue, cheek and lips was carcinoma. The one involving the tongue, tonsils and fauces was epithelioma, and that of the cheek and lip, epithelioma.

The glands were demonstrably enlarged in only fifteen cases on the same side with the growth and on both sides in five cases. In twenty-six of the thirty-three cases operated upon, the glands were removed on both sides. In several cases the growth was so extensive and the glandular involvement so great that no attempt was made to remove them, the operation being done to relieve the patient of some of the distressing symptoms.

Of the thirty-six cases of carcinoma and epithelioma involving the buccal surfaces, fourteen were of the lip alone; of these thirteen of the lower lip and one of the upper lip. Of the thirteen of the lower lip nine involved one side only, and of these two had submaxillaries on same side enlarged (in one microscopic examination showed no metastasis), one had cervicals on same side involved, one had no glandular involvement, one had submaxillaries

of both sides involved, one had no mention of glands made, three had glandular involvement, but location was not definitely stated; of these two had microscopic examination and showed no metastasis. One involved middle of lip, no mention of gland involvement; three involved whole lip, one had glandular involvement of one side, one had glandular involvement of both sides, in both cases submaxillary, one had no glandular involvement; in one case involving the upper lip there was growth on one side only, glandular involvement was on both sides.

There were seven epitheliomas of the cheek; of these three had enlargement of the submaxillary lymphatics on same side, two showed metastasis microscopically, one did not, four had no mention of glandular condition.

There were eleven cases of epithelioma of the tongue, nine were situated on one part or side of the tongue. Of these two had enlargement of submaxillary glands on same side, one had enlargement of submaxillary glands on both sides, three had no glandular involvement, three had no mention of glands; two had both sides of tongue involved, one had metastasis to the same side of neck as greatest involvement, one had glandular involvement, location not stated.

There was one case of carcinoma of the tongue, and lip, and cheek. It was on one side of the mouth and showed no glandular involvement.

There was one case involving tongue and floor of the mouth; it showed involvement of submaxillary glands on both sides.

There was one case involving lip and cheek, no mention of glands was made. There was one case involving tongue, tonsils and fauces, no mention of gland condition.

The primary sore of syphilis is a most contagious lesion and is commonly found on the lips, tongue, buccal mucous membrane and tonsils.

It is important to distinguish between chancre and cancer. The diagnosis is comparatively easy and certain. The points are first, chancre of the lips and oral cavity is more common in women, the reverse being true of cancer. Chancre develops rapidly, and the lymphatics are involved at the same time and are distinctly tender and painful. The chancre has a characteristic hardness of

the indurated area, feeling like a stiff cardboard beneath the mucous membrane. The chancre starts as a round shot-like growth and becomes ulcerated later, while the cancer starts as a slow, indolent ulcer, slow growing and with late involvement of the glands. Chancre responds promptly to treatment, cancer not at all except complete excision.

The diagnosis is not always easy to make, especially in the early stages, when most good can be accomplished by radical treatment. A patch of leucoplakia; a wart; a patch of persistent herpes; a fissured lip, which is rebellious to treatment, should always be viewed with great suspicion. It is well to emphasize the fact that in patients past the fortieth year of age, any pathologic manifestations on the lip, tongue or buccal mucous membrane if not actually malignant are liable to become so. The nearer the corner of the lip, the more rapidly the tumor will grow, and we must therefore be especially suspicious of lesions in this locality, as they rapidly involve the buccal mucous membrane and the tongue.

The characteristic feature of epithelioma is the surrounding hardness, especially of labial epithelioma. The area of induration extends beyond the limits of the discernible lesion. Pain is a late manifestation, only becoming extreme when the disease has advanced far enough to involve the neighboring bone. It is most unfortunate that pain is not an early symptom, as it of itself would be the means of saving many lives and much suffering by driving patients to early operation.

In addition to induration, the tumor of epithelioma and carcinoma becomes elevated and ulcerated, bleeding freely on touch.

The diagnosis must be made on the age and sex of the patient; the location of the growth; the anamnesis; the induration; the ulcerated, malignant appearance of the growth, and its resistance to treatment; and early and constant involvement of the cervical lymphatics.

The prognosis depends on the character of the growth, its age, the extent of the involvement, the locality involved, and the extent of metastasis and the thoroughness with which the disease is eradicated.

Epithelioma is a lower degree of malignancy than is either carcinoma or sarcoma. It remains local for a longer time. It

involves neighboring tissues more slowly, and the metastasis is slower. It therefore offers the best prognosis. Carcinoma is most common on the tongue and buccal mucous membrane. It is apt to be rapid in growth and metastasis, and is less favorable in every respect. However, it has its local period, and if removed at this time it can be cured. The operation, however, is so mutilating that patients are reluctant to submit to it.

As I have said before, the best prognosis is for lip growth, the next most favorable the tongue, and the most unfavorable the buccal mucous membrane. The fauces and tonsils are also extremely unfavorable sites for malignant growths.

The prophylactic treatment is of great importance. It is certainly more desirable to prevent cancer than to try to cure it. I believe that a great deal can be done to prevent cancer in the part of the body which concerns us to-night. All sources of irritation should be eradicated; rough points of teeth; overlapping teeth; teeth which are constantly biting the tongue or buccal mucous membrane had better be extracted. Great care should be exercised in the fitting of artificial teeth, careful watchfulness as to their cleanliness is necessary. The smoothness and accuracy of the fit should be looked into by the dentist at regular and frequent intervals.

Leucoplakia should be treated vigorously by antiseptic washes and cauterization. Internal treatment is also of importance so that the salivary and mucous secretions should be absolutely non-irritating or medicated. Locally, the following washes have been successfully used in my hands:

Hydrogen dioxide, 30 per cent dilution.

Liquor antisepticus.

Potassium chlorate, saturated solution.

Acid boric, saturated solution.

Cauterization with silver nitrate is a valuable local treatment. Internally, the administration of potassium iodid, even though the patient is free from specific infection, is beneficial, as iodine will be eliminated through the saliva and will aid in the treatment of the disease.

Our experience at the German Hospital with the X-ray treatment of this class of cancers has not been very satisfactory. We

have found that the skin cancers are the most favorable for X-ray treatment, the next most favorable being those of the dry mucous membrane, *i. e.*, the dry mucous membrane of the upper and lower lip. The most unfavorable are those within the oral cavity and that variety of epithelioma which involves both skin and mucous membrane. In our hands not one in this locality responds to X-ray treatment. The failure to cure by X-ray treatment is due to the fact that it does not prevent metastatic involvement of the lymphatics. It is also a question whether the X-ray does not exert its greatest activity on the associated inflammatory condition of the involved area. I cannot subscribe to the enthusiastic opinion of some of our X-rayists in their claims for X-ray treatment of malignant growths in general. I am of the opinion that the early complete removal of the growth, the lymph channels and glands, is the only rational treatment. If we have one point of definite knowledge of the subject it is that every cancer at some stage of its career is absolutely a local disease, and that if removed at this time there will be no metastasis or spread of the disease and therefore the cancer will not return.

There are many factors to be considered in deciding upon the operative treatment of cancer of the mouth. The age of the patient; the condition of the organs, especially the kidneys, heart and arteries; the character of the growth; the area of the involvement of the lymphatic glands, are points to be thought of and duly weighed. If radical treatment is carried out the most favorable location from the operative standpoint is the lower lip, the next most favorable the upper lip, the third the tongue, the last and most favorable the buccal mucous membrane. The most favorable time for operation is very early; in fact, so very early that there may be some doubt as to the diagnosis. By extermination of the growth at this time, when it is purely local, and at the same time removing neighboring lymphatic glands, we can cure a vast majority of these cases. The growths upon the buccal mucous membrane present a more serious condition. For some reason they grow more rapidly and show a decided tendency to spread in area. They are of a higher degree of malignancy, are much more difficult to eradicate, and are very commonly associated with infection. Lymphatic involvement is usually of both

anterior and posterior chains, and altogether this location presents a very serious condition. There is no use in attempting any procedure unless one is prepared to do a complete excision of both anterior and posterior lymphatic chains. This necessarily means an extensive dissection of the neck, including removal of the internal jugular vein, the connective tissue and glands in one piece, and the splitting of the cheek back to the angle of the jaw, with the extirpation of the growth. In these cases it is not uncommon to find the submaxillary salivary gland involved in the metastatic process; in such event it is imperative that this gland be also removed.

In removal of the lip growth a V-shaped incision, well wide of the growth, should be made. It is surprising how much of the lip can be excised without creating permanent deformity. A wedge-shaped piece with a base of one or two inches can be removed, and, subsequent to proper healing, very little puckering or deformity will be noticed. In tongue growth the amount to be removed will be regulated by the extent of the involvement and the time elapsed. It may be possible in very early growth to remove that portion of the tongue which is involved, later it may be necessary to remove one lateral half of the organ, and in advanced cases the removal of the whole organ becomes necessary. In the more extensive operations it will be wise to tie the lingual arteries in the neck before attempting the excision of the tongue. This procedure can be carried through the incision for the removal of the cervical lymphatic glands. In removing the glands in the cases of buccal involvement it is a wise precaution to tie the facial artery through the original wound. This will make the removal of the growth very much less bloody.—*Dental Brief*.

PYORRHEA ALVEOLARIS. by E. D. Dudley, L.D.S. Eng., Bath, England. I may be pardoned perhaps if I open up new ground and offer you a few remarks (hardly a paper) upon a disease which periodically occurs in our practices and which is always perplexing and difficult to deal with, viz., pyorrhea alveolaris. The disease was first recognized and commented upon by Dr. Riggs, of the United States of America, in 1844; from

that time it has always been associated with his name, and is generally known to us as Riggs' disease.

I think, in many ways, it is one of the most distressing conditions of the mouth which arise in our practice, and at present we appear to know little of its pathology, and our treatment is, therefore, to a certain extent, but groping in the dark; we need no statistical proof to affirm that diseases that are associated with and attack the soft structures of the mouth, especially those near and adjacent to the alveoli, are more difficult to treat and more likely to occur than those that attack the teeth themselves. One well-known author on dental diseases states that as many teeth are lost by pyorrhea as by caries.

The etiology of pyorrhea (the word means a flowing of pus) is entirely a speculation; we know that it is a perversion of the normal standard of health of the part concerned, ending (if not successfully treated) in the death and ultimate loss of the teeth implicated. But we are not agreed as to whether the disease is constitutional or merely local. Is it due to calculus or bacteria? Is it a primary or secondary lesion? Is it associated with gout, rheumatism, anemia, dyspepsia, bad air, food, and general hygienic neglect?

Dr. Barrett's book divides the disease into three conditions: (1) Due to local irritation; (2) due to calculus on the roots of teeth forming pockets; (3) due to, or coincident with, constitutional symptoms. A well-known authority upon the disease says that it may act in three different ways in the causation of systemic disease; the pus and the putrefying elements from the sockets may be swallowed and so act upon the wall of the alimentary canal, or set up fermentation of the contents of the stomach. The toxins generated in the mouth may be absorbed by the mucous membrane of the mouth or stomach, and so pass into the general circulation. The local condition of the mouth may favor the growth of pathogenic organisms and so render the patient more liable to infectious complaint, such as influenza, etc.

There is no doubt that many troubles connected with indigestion are due to the constant absorption of pus from pyorrhea. I noticed a little time back in the Dental Journal a few notes from Major Buchanan, of the Indian Medical Service, in which he

states that he noticed that many prisoners in one of the large Indian gaols were suffering from pyorrhea—in a population of 1,000 there were 200 cases; on making inquiry from seventeen other medical officers in the central provinces, it was found that the disease was more prevalent in those districts in which famine had been most severe. It was difficult to get positive evidence on the question of the influence of pyorrhea on the general health; in severe cases the breath was necessarily very foul, and it would be reasonable to suppose that the crowding together of a large number of such cases would have an injurious effect upon the general health. In a batch of ninety prisoners who had come from one of the districts mostly affected by the famine, over seventy were suffering from pyorrhea; the disease was cured, and in six weeks these ninety men had made a net gain of 700 lbs. in weight, or an average of 8 lbs. per man.

Of course, in order to show that the increase was due to the removal of the pyorrhea, it would be necessary to exclude other causes, but that in this case could not be done, for it was after the famine, and there is no doubt that the people were better fed in the gaol than outside; still, the great improvement in these men led one to believe that the curing of the pyorrhea had a considerable influence in effecting an improvement in their general condition.

In all cases of pyorrhea there is a progressive loosening of the teeth, with a corresponding loss of the alveoli and pericemental membrane, accompanied by a flow of pus from the hypertrophied gum; the time that elapses from the first appearance of the trouble and the final loss of the teeth varies considerably.

The late Dr. Miller, of Berlin, quotes a case in which the lower incisors were lost three weeks after they began to loosen, this being a case of acute pyorrhea. In the majority of cases, the disease runs a lengthy course before either being cured or ending in the loss of the teeth; as a rule adults are the sufferers, but very occasionally one finds the disease in children; it seems to have no connection with caries, the affected teeth being, as a rule, of singularly sound structure. The symptoms begin with a spongy hypertrophied condition of the gum, the lower incisors being, as a rule, the first to be attacked; as the gums recede, salivary cal-

culus is deposited upon the denuded roots of the teeth; inflammation of the pericemental membrane follows, forming the so-called pockets round the teeth from which, on pressure or otherwise, pus or mucopurulent fluid exudes; the alveolus wastes, and at length the teeth become so loose that they may fall out with the slightest touch. Pain is, as a rule, absent, except in the last stage, when the teeth become tender and elongated.

Pyorrhea is often associated with anemia, in many cases it is often a question whether the pyorrhea arises from the anemic state of health or *vice versa*, but often the health of anemic patients improves from the date of the treatment of the pyorrhea. The treatment of the disease consists of the removal of the calculus, combined with a therapeutic treatment. The scalers should be delicately fashioned and as sharp as possible; a pushing motion with a scaler is far less irksome to the patient than a pulling. For the treatment of the pockets we may use such drugs as hydrogen dioxid, mercury bichlorid, and our old tried friend, copper sulphate, especial care being taken not to introduce these drugs with a steel instrument. The best way is to roll a wisp of cotton wool round a blunt excavator, and introduce the drug in this way.

Antiseptic mouth washes should be used both in the surgery and by the patient at home; of course, absolute cleanliness of the pockets is the one and most important of the methods of treatment. I think we shall find an ordinary dental syringe of little use in syringing the pockets. Of late I have used, with great success, a dental atomizer, which has the great advantage that it can be used by the patient at home; the nozzle can be turned to any angle, thereby enabling the patient to direct the fluid in any direction. The patient holds the bottle in one hand, working up a considerable force of air with the bellows with the other hand; then, by the aid of a looking-glass, the fluid can be forced in any direction. All dental depôts keep these atomizers in stock.

A comparatively new method of treating pyorrhea has been embodied in an interesting brochure of twenty-six pages, by Mons. Leger-Dorez. It had its origin in the following manner: In September, 1902, the author tells us, he was consulted by a lady of twenty-seven years, whose mouth exhibited all the symp-

toms of mercurial gingivitis, due to the introduction of mercury into the system. Local treatment in the shape of antiseptic washings and dressings effected some improvement; six teeth, however, resisted all attempts to remedy. The extraction of these had been decided upon, when it occurred to the author that the same method of treating inflammatory surfaces—viz., by the insufflations of oxygen gas—which had been successfully practiced on the Continent, might be resorted to in the present case. The results, he claims, were of a most successful character.

The tooth selected for the first experiment was the left upper lateral incisor, by reason of its being in a worse condition than the other teeth. It "floated in the alveolus," and there was an abscess with a sinus at the apex of the root. After careful cleansing, the tooth was perforated on the lingual surface and the pulp cavity was exposed. Strangely enough, the tooth appearing very little discolored in the electric light, this cavity presented no sensitiveness; the pulp was partly atrophied, though still alive, and was removed with an excavator. After carefully cleansing the canal the apex was perforated; this caused a slight hemorrhage, which was arrested by a solution of adrenalin. A Pravaz syringe needle, attached to a fine rubber tube connected with a cylinder of oxygen gas, was introduced far into the canal, and a strong pressure of the gas carried along the tube and needle was allowed to penetrate deeply into the apical canal, reappearing by inflating the gingival wall near the mouth of the sinus. This operation was repeated three times, after which the author noticed a complete cure. The tooth was then filled, the canal being treated with a preparation of creosote, formol and zinc oxid. Eight days later, the author avers, the tooth had assumed all its ordinary functions, its color being nearly normal. After a long absence in the country the patient was seen again.

The inflammatory affection continued its ravages upon the remaining affected teeth, two of which were the central incisor and cuspid situated on either side of the lateral incisor which had been treated. This lateral incisor alone was entirely and radically cured. "Needless to say," the author adds, "the other teeth were immediately treated in the same fashion with the same success."

The satisfactory treatment, upon these lines, of several cases of

pyorrhea alveolaris and allied pathologic conditions, which the author fully describes, together with the facts ascertained by him in opening up affected teeth, leads him to believe that it is the pulp alone which is the seat of the trouble. The more or less profound functional disturbances occurring in the subject, disorganizing the blood, reflect themselves violently in the vascular dental system, and the fine diameter of the apical foramen readily lends itself to inflammatory change. Congestion, followed by supuration and gangrenous degeneration of the pulp, takes place, producing septic conditions, and finally the death and expulsion of the tooth. I regret that want of time prevents me from giving more fully the author's view of the etiology of the question, and I therefore merely give a summary of them in the foregoing.

Where local treatment is successful, the author states, is where the subjects are young and the malady is of recent standing, the tooth possessing a vigorous pulp and a wide and well permeable apical foramen; the congested pulp is able, in effect, under the effort of a violent revulsion upon the gum, to eliminate the affluxion of blood, and if the general state of the patient be not too bad the tooth can return to its normal state. The treatment advocated by the author, as outlined above, involves the opening up of the tooth. "Pits of investigation," as he terms them, must be made by drilling toward the pulp of the tooth—an operation usually not painful. A 4 per cent solution of cocain hydrochlorid applied on wool to the cavity will annul the sensitiveness of the pulp, if by chance any exist, which is rare. The *débris* is next removed, the cavity carefully washed out, first with chlorinated water, then with Vichy water, and a plug freely saturated with tincture of iodine or a 40 per cent preparation of formol passed into the cavity, following upon which the insufflations of oxygen gas are carried out. The needle used for this purpose is surrounded by a tiny collar of soft wax, which can be pressed lightly upon the cavity to insure hermetical closure. The volume of gas disinfects all the interior of the pulp cavity and canal, infiltrating them with the tincture of iodine which it carries along with it.

After three or four insufflations, when the inflammatory phenomena will have disappeared, the canal and the pulp chamber

can be filled with the following paste, mixed to the consistency of a dental cement:

℞ Creosoti,10 grammes
Formol,10 grammes
Zinci oxidiq.s. to make paste

"Never," concludes the author, "need one fear that the tooth thus treated will ever again be subject to pyorrhea alveolaris."

This is a bold declaration, and may induce other practitioners to try the method. M. Leger-Dorez has certainly given us some good reasons for believing in him. So far, pyorrhea alveolaris has been considered almost incurable, and M. Leger-Dorez has done well in bringing this subject to the front in his useful booklet.—*British Dental Journal*.

PRACTICAL ORTHODONTIA. By J. G. Lane, D.D.S., Philadelphia, Pa. An important advance in orthodontia of to-day is that it is a painless and brief process as compared with the regulating processes of a few years back; furthermore, the teeth whose malposition is corrected remain correct in a manner that was not by any means always realized in earlier days. Indeed, the systems by which these operations are conducted are not systems that have been revised or improved or added to, but are all entirely new, the old being nowhere in evidence, except in dust-covered text-books and private curio collections. To the honor of the profession, be it said, that present-day operations in orthodontia are of such a degree of efficiency that we can look upon them with the utmost gratification, and to Angle, Jackson, Knapp and others, whose practical experimentation and ingenuity have brought about this metamorphosis, we feel like saying, "Well done, good and faithful servant."

Most deplorable in the statistics of orthodontia practice is the discouraging percentage of failure; but for every failure there is a logical reason, and if we are persistent to that end we will be successful in finding it.

Let us consider some of the causes of failure. At the head of the list we would place dislike of the work and lack of technical skill on the part of the operator, the two being generally associated as cause and effect. Orthodontia is by many regarded as the most

undesirable and unremunerative field in dentistry, but even if we so regard it we cannot go at it in an indifferent and half-hearted manner and be successful. Every regular practitioner has at some time or other—or possibly many times—found himself confronted with an obstinate case of irregularity in the mouth of a little daughter of one of his best patients. He may not want to handle the case, and may try to explain it away with the information that in all probability a few years of nature's own efforts will suffice to bring about the much coveted condition. This is cowardly and unprofessional. To extract a tooth or two in addition to the above explanation is not only cowardly and unprofessional, but criminal. If we feel that we do not have the desire or time or ability to attempt the cases of irregularity or malformation that come to us in our regular practice we should not resort to the cowardly or criminal practices referred to, but promptly refer the work to a competent specialist.

I would, however, strongly urge that regular practitioners take care of their own orthodontia cases. The more varied we can make our work the less monotonous it will be, and we find that in addition to the satisfaction of taking care of our own patients in our own office, and with results that are as satisfactory and lucrative as from any other class of dental practice, having a case or two of orthodontia on hand all the while is in reality a diversion that amounts almost to a recreation. If variety is the spice of life we may as well add a little spice all the while by taking care of this work ourselves. Our patients, too, will feel more at home in our hands than in those of a stranger. This plea that dental practitioners shall take care of their own orthodontia cases is based on the assumption that they are sufficiently experienced and capable to get proper results with as little discomfort to the patient and expenditure of time as may be possible. If they cannot feel reasonably sure of this they should give the specialist the case.

Another very prominent cause of failure lies in the lack of thoroughness in studying out cases in advance of the attempt to operate. In a given case of orthodontia there are so many attendant conditions—many not shown in the mouth—that it is an easy matter to overlook some of them; but we can overlook nothing and be sure of success. In addition to studying the actual irregularity or malocclusion present we must include in our study such features as

age, sex, physical condition, the age most suitable to begin the case in question, facial expression, restoration, etc. Further, there must be taken into consideration the direct or underlying causes, such as mouth-breathing, which may be the direct result of catarrhal conditions, adenoids or habits such as thumb-sucking, tongue-sucking, the use of "baby comforters," malformation of teeth, mutilation, noneruption, broken-down or badly decayed crowns, etc. The immediate nature of the malocclusion to be corrected must be considered as well as the kind of force most suitable for the case and the form of appliance necessary for its successful application. The comfort of the patient must also be given due attention. The conclusions arrived at on all of these points must combine to form a working scheme which will insure success.

The age most suitable for an operation in orthodontia cannot be stated in figures. For the strong and robust patient orthodontia would be possible at an earlier age than would be deemed advisable for one who was less favored physically. In almost every case the earlier the work is done the better. The earliest possible age at which the patient can and will endure the operation and still have a sufficient surplus of energy and power of endurance left over is the time and age at which the operation is most advisable. Certain conditions in a few extreme cases may modify this statement slightly, but generally speaking this would be the time most suitable. Occasionally the peculiarities of the case may suggest that it be left until later; but knowing that every year of existence adds very materially to the stability of the teeth in their sockets and thus increases the difficulty of moving them we find it better judgment to err on the safe side and try the case too young rather than to wait too long. For a given operation boys can be operated on earlier in life than girls. We find a difference of possibly one and one-half to two years. Girls are less strongly constituted and as a class more nervous, also have less power of endurance. For these operations we might designate the latter condition as "spunk;" and the amount of spunk we have to draw upon in the patient must be taken into consideration in determining what we can or cannot do. All other things being equal we may expect a far greater degree of success and less amount of trouble with our young patients who have an abundance of this requisite than we could have if this very important essential were comparatively lack-

ing. Under no consideration would we attempt an orthodontic operation for a girl patient who has just arrived—or is arriving—at the age of puberty. At that time her nervous system is very easily wrecked and she is in no condition to undergo the ordeal. Defer the case; or if already under way retard it for a time.

If the patient is a mouth-breather, the cause of the habit must be determined. If it is the result of the presence of adenoids, the case should be treated by the rhinologist in advance of the orthodontist, and the cause be thus removed. If catarrhal conditions are responsible for the trouble, they should be reduced as far as possible before we begin our operation. Recognizing the impossibility of absolutely curing catarrh is why this statement is qualified. It can, however, in most cases be reduced to the extent that if the patient is more or less persistent the mouth need not be used as a nose. If the mouth-breathing is the result of habit, this can be dealt with only by members of the patient's family, by associates, or others who have been instructed to call the patient's attention to it in a suitable manner as often as occasion may require. Many cases of malocclusion and facial deformity are caused by thumb-sucking. Persistence in this practice is responsible for the widened lower arch with flat front, and contracted "V"-shaped upper arch with protruding incisors that are so often seen. The means of prevention are scarcely within the province of the dentist. The damage is usually done before we have had an opportunity to advise against it. Mothers and grandmothers are prone to think it "cute" and "just too sweet for anything" to see baby with his thumb in his mouth, and angry because he can't get both thumbs or his whole fist in. Others will teach very young children to attain this accomplishment in order to make them be "good" babies, and their care more easy. We are not in position to see what takes place in the households of most of our patients, or the practices indulged in by the very young members who are probably our prospective patients. However, as often as we may have knowledge of these conditions it is our duty to seize the opportunity and advise accordingly. The most thorough method of reaching the real cause of this difficulty is doubtless through the physician. He has far more opportunity of seeing the primary stages of this difficulty than we have and can do more for its arrest than we can. This and various other simple dental conditions, about which he usually knows nothing, but will

persist in dabbling with, to the chagrin of himself, the annoyance of the dentist, and to ultimate misfortune for the patient, should be made a part of his college course. The evil effects of the use of the "baby comforter" are in the same general class as those of thumb-sucking, but not by any means so disastrous. The use of these devices could be prevented in the manner described for thumb-sucking. Tongue-sucking is a rather infrequent practice indulged in later in life. It is not often that bad results will follow from it, for the reason that the teeth are almost invariably in rigid occlusion during the act. In the event of an active necessity for the discontinuance of this habit we are confronted by a real difficulty. We cannot hope to enlist the cooperation of the patient nor the services of any one else to further our efforts, but must rely on mechanical contrivances. A plate or other fixture, that will by its presence decidedly change the shape of the vault of the arch or that part of the mouth against which the tongue rests while being sucked, may be placed in the mouth to militate against the comfort or satisfaction the patient derives from indulgence in the habit. It may require a variety of fixtures, each with its own particular kind of interference, so that as soon as the tongue becomes accustomed to one fixture another can be put in its place to provide a different shaped surface for the tongue to bear against. This changing of fixtures will have to be repeated as often as may be necessary until the habit is broken up.

The pressure that we apply to the teeth to cause them to change their positions is of two distinct kinds, which, for convenience of description, may be termed elastic force, and its direct opposite, inelastic force or "positive" force. This distinction is dependent entirely upon the method of application. A screw, bar, arch, ligatures of wire, levers, etc., will act with a "positive" or inelastic pressure, while springs, rubber blocks, rubber bands, etc., will deliver an elastic force. The inelastic force may at any time be made to take the place of the elastic, but the latter will not by any means take the place of the former. We recognize the unquestioned superiority of the positive over the elastic forces; also its ability to move any or all teeth in orthodontic operations. But, at the same time, we cannot overlook the convenience of application and the rapidity of results in the use of elastic pressure where its use is indicated. I have seen a cuspid lengthened a quarter of an inch into position

by the use of rubber bands in six or seven days. The same results, if gotten by wire ligature or screw, would require many times as long, unless we could see the case every three or four hours, or rely on the patient to operate the fixtures—neither of which courses is advisable. If this same superior cuspid had happened to be of proper length and had occluded inside instead of outside the lower arch, a rubber band, or any means of producing an elastic force, would have been of no service whatever. The kind of force indicated in a given operation is dependent entirely on the peculiarities of the case. Moving a tooth past its ill positioned or crowded neighbors, or through a narrow space, requires, in addition to the force actually necessary to move the tooth in question, a force sufficient to overcome the resistance and interference offered by the presence of the adjoining teeth. If these combined forces are applied by any elastic medium the tooth is liable to be almost dragged from its socket as soon as it has passed the point of outside interference on account of the added pressure—which is then unnecessary—this pressure being elastic and not self-limiting in its action. There can be no question that in a great majority of the cases the work is best accomplished by positive force. It might be thought that screws, wire ligatures, etc., which have to be tightened and adjusted at regular intervals and thus have each increase in their advance movement at one moment during each sitting, would not deliver a continuous force. Strictly speaking, they do not, but so far as the effect on the tooth or teeth is concerned, the pressure is not only continuous but positive. We know of no other appliances that will work with a more positive and continuous pressure than screws and wire ligatures. In addition to the pressure delivered by screws and wire ligatures being a continuous and positive one, their action is self-controlling or self-limiting. These latter features are absolutely essential in many cases, and advisable in nearly all cases; but in order that this result may obtain it is essential that the adjustment shall be at such intervals as shall cause the teeth to follow along as fast as the degree of absorption produced will allow.

Summing up, it will be seen that the sphere of usefulness in the discretionary application of fixtures, to produce elastic force for the movement of teeth, is very circumscribed, and can be relied on as being proper only where there are no forces whatever to over-

come save those embodied in the natural attachment of the teeth in their sockets, and where the action of the fixture does not need to be self-controlling or self-limiting in its range of movement. It is also evident that in any and every case an unyielding or positive force will accomplish the same result, and in a more definite manner, but may require more time and a greater elaboration of fixtures.

The question, what method, or fixture, or system of fixtures, shall be used, may now be considered. As we all know, the textbooks and dental depots are abundantly supplied with "systems," each of which is claimed by its originator (who is supposed to be an expert orthodontist) to be the best. "Who shall decide when doctors disagree?" Dr. Angle has devised a system of fixtures, which he believes, and justly, fully adequate for any and all cases of orthodontia. The same may be said of Knapp, and also of Jackson's system of appliances and perhaps of others. These men who are experts in their specialty have all had successful results, each using his own pet ideas in regard to system and fixtures used. The question is: Can you and I have the same measure of success that they have had if we use their appliances? On this point it may be said that each man's individuality is in the fixtures he devises in just the same manner as every operator's individuality is embodied in his most cherished excavators and pluggers, devised in accordance with his own ideas. I do not wish to be misconstrued as meaning that I think it impossible to achieve success unless we design our own fixtures or have our own "systems" to follow. Far from it; but I do think that we should not wed ourselves to any one man's idea, or any one idea of our own, and use it as a hobby until we ride it to death. Our own ideas of the mechanical principles that are necessary to be embodied in fixtures for a given case, with due regard to lack of annoyance to the patient, speed in the progress of the case, the reliability of the fixtures, and the possibilities of ultimate success are the main factors which, when summed up, will, in all probability, lead us to utilize this or that principle of Angle's, possibly others of Knapp's and probably some of Jackson's to combine with those that we originate in our own brains, thus having a fixture we construct according to our own ideas and with our own hands. Thus created, it will embody our own individuality, and will be one the working of which we thoroughly understand; now under our

manipulation it will be far more submissive to our desires and intentions than a fixture that is entirely the idea of another, and that would necessitate our having the same line of thought as its originator to make it effective.

Making up fixtures is an exceedingly simple and enticing operation. An occasional hour spent in this way is really pastime. Fixtures purchased at a dental depot usually have to be reshaped and often soldering is necessary. The time thus consumed is frequently sufficient to have allowed the whole outfit to be made *de novo* to suit the particular case in hand.

The suffering occasioned by orthodontic operations, as they were practiced, say fifteen years ago, was of such a degree of intensity that many times patients could not endure it. In those days any and all cases were operated on by some sort of a plate, either of hard rubber or of gold, with the various other necessary attachments fastened to it and forming a part of it. This plate was usually retained in position by ligating it to several teeth. It seemed to matter not what were the peculiarities of the case, the plate was inevitable. Present-day orthodontic operations are by no means so painful as those of years ago. We might say they are entirely devoid of any considerable suffering, although there is, of course, necessarily involved more or less pain and a certain degree of annoyance and inconvenience. Analyzing the conditions we find that inasmuch as the principal difference between the fixtures of the two periods lies in the fact that the old used the soft tissues as an anchorage or foundation and the new do not, we at once make the deduction that the difference in pain was due to the fixtures bearing against the soft tissues. By actual test this proves to have been the main cause of much of the misery and discouragement in the old-time operations. Acting on this we find that one of the first essentials in our fixture is that it shall under no consideration whatever bear against the soft tissues. Any part of our device that bears against the gum immediately produces irritation, then follows inflammation and more or less hypertrophy. As the fixture is fastened to the teeth in places it cannot move away to allow for any enlargement of tissue that may occur incident to the inflammation present and we at once have a condition similar to the effect produced by a too tight boot on our foot during a hot summer day, and with no opportunity of removing the boot. If the

mucous membrane is not used in any way as a foundation for our fixtures, we eliminate the cause of the lion's share of pain and discomfort. Aside from the fact that for comfort the fixtures should not impinge on the gum it is never necessary for them to do so. If we wish to change the shape and relative position of the alveolar process it is only necessary to move bodily the row of teeth held by that process and the process moves with it. Our fixtures should be made as light as is consistent with strength; have all attachments, nuts, screws, joints, ends of wires, etc., located in such position as to cause the least possible abrasion of the movable tissues; they should be smooth and thoroughly finished, and should include in their make-up the possibilities of all the various purposes and movements necessary to complete the case for which they are made. The necessity for removing a fixture from a half-finished case and substituting another to continue the work on other lines is much to be deprecated. One fixture should suffice and in almost every case will suffice to complete the operation. Fitting new fixtures on a half-finished case is an extremely severe ordeal for the patient on account of teeth being more or less loosened by the action of the previous fixture. Fitting bands for retaining fixtures is equally painful for the same reason. All this can be avoided by fitting the bands for a second fixture (if such a fixture should be necessary) or for retaining devices before we apply and operate the first fixture. The bands thus fitted should be stuck on a small sheet of wax in their relative positions, thus establishing their identity, when needed for use.

Generally speaking, I would advise against the use of any appliance that can be removed or replaced at will by the patient. Such an appliance will be successful only when the patient is thoroughly dependable. If a patient is entrusted to operate a nut or series of nuts or screws a definite number of revolutions per day, according to our instructions, upon his return to our office we can at once tell approximately whether he has or has not been faithful to the work; but with a removable or portable fixture our most trusted patient may have failed to follow instructions, and we have no means of procuring evidence to the contrary.

A firmly attached fixture will execute any movement that could be performed by a removable appliance, and we are far more sure of proper results. Good results may be obtained by having the

patient adjust nuts and screws whenever these parts of the fixture are readily accessible and the case not complicated. Even this, however, must be entrusted to the patient in short intervals only, so that we may keep a close scrutiny of the work. The only object in having the patient perform any part of the work is that if, for example, a nut is tightened one revolution per day for six days, far less pain will be experienced than if we tighten up the same nut six revolutions at intervals of six days. Of course, the final result would be the same in either case, except the difference in the degree of pain. Our fixtures shall always embody the possibility of adjustment with the least possible waste of time. It is often wise to spend more time in making a fixture, if such fixture, when completed, can be operated or adjusted in less time. Our patients become annoyed by too much tinkering about the mouth, especially when the teeth are sore. Furthermore, we find that a little waste of time at each adjustment is, in the aggregate, quite a consideration, in which event either we will not realize on all our time or the patient will be charged a fee that is unnecessarily large.

Permanent retention is possible only with normal occlusions. Each arch retains its antagonist. The teeth are provided with cusps and angles and planes, the shape of which for each tooth is exactly suitable for its place in the arch and the opposition of its antagonist. With a proper arrangement of the teeth the cusps are interlocking and the planes exactly fitting against opposing planes. In general, such an arrangement of the teeth would render unnecessary any retaining device other than that required to steady the teeth during the final stages of resorption.

As stated elsewhere in this paper, the cause of the irregularity must be removed. If the malocclusion has been caused by mutilation, or a failure to erupt, or by badly broken or decayed crowns, the cause can be removed only after the orthodontic operation has been completed and the case is ready for a retention appliance. At this stage all spaces should have been filled in by bridges or otherwise, and broken teeth properly crowned. We cannot have normal occlusion and have spaces. Sometimes a patient will request that this or that overlapping incisor be straightened and that the others, not being conspicuous, be left alone. If the objectionable tooth owes its condition to the malposition of other teeth, as it nearly

always does, compliance with this request would be just about as good judgment as complying with a request that we should not excavate some part of a cavity because it hurts and doesn't show, anyway. If a tooth is straightened, regardless of others, it will not remain in its new position unless the retainers are kept in situ till death. Inasmuch as the ultimate success of the operation depends upon the teeth remaining in their new positions it is patent to all, that if this part of the work proves a failure all is a failure. Therefore, normal occlusion is imperative.

It will have been observed that in this paper much stress has been laid on the consideration of the patient's comfort. The possibilities of pain are lurking everywhere and at every stage of orthodontic operations; and a very little carelessness, thoughtlessness, indifference or inexperience on our part may be the means of producing such an amount of persistent suffering as would incapacitate our patron for weeks or months. The study of our patient's comfort is of as much importance as any other part of the work and should be prosecuted with just as much diligence. The operator who causes needless pain and misery is unprofessional and undeserving of public patronage.—*Dental Brief*.

NEURALGIAS. By Dr. C. M. Cahill, Valparaiso, Ind. A large proportion of patients presenting with this disorder live sedentary lives. Their surroundings are often unsanitary, and the patients themselves quite frequently seem to give little or no thought to personal hygiene. A complete knowledge of the habits, vocation and surroundings of the patient is often of inestimable value in determining what line to pursue. As a general thing, the patient presenting with neuralgia is in a debilitated condition, atonic and anemic. Nearly always he will require some general nerve tonic, the selection of which lies with the discretion of the dentist. If the neuralgia is the result of some exhausting fever or long illness, bitter tonics are especially helpful. I have used and like such as nux vomica or compound tincture of gentian. Neuralgias of miasmatic origin seem to yield readily to a tonic of quinin sulphate.

First patient. Lady, age 34; married; teacher, busy from 8:30 a. m. to 6 p. m. Work nervous and tiring in its nature.

No devitalizations in this patient's mouth whatever. Could find no cavities. Removed all metal fillings in teeth. Found no evidence of pain due to improperly inserted fillings. Could not sleep without taking one, two or sometimes three chlorodyne tablets. Being well acquainted with the family, I knew she always got a liberal supply of good, stimulating food, and that her habits were regular. A survey of the home found everything in a sanitary condition. Absolute quiet—rest from work—was what I considered necessary in this case. She would not stop work, but she would take medicine. I gave her fluid extract of gelsemium, from 10 to 20 minims every three hours.

At the close of the school year the lady took a rest. At the end of one month she wrote me she was free from neuralgia. She remained out of school work for a year and built up her system. During the past two years she has been again at her school work, and I have done considerable operating for her. She has had no return of the neuralgia. In my opinion, this was a case of a nervous breakdown, and a rest was indicated more than anything else.

Patient No. 2. Male, 26 years of age; all posterior teeth on left inferior maxilla were gone. Badly scarred face. Thinking that more his business than mine, and being somewhat modest, I did not ask him how he got scarred in that shape. Complained of great pain extending from lower left cuspid to temple and seeming to affect the eye. I examined teeth carefully, but found none that was carious. Found the gums in the pleasing state usual where toothbrush and mouthwash are as religiously attended to as they should be. Tried fluid extract of gelsemium on this patient. Result negative. Presented in a week "nearly dead," he expressed it. Thoroughly dissatisfied with my diagnosis and quite ashamed of myself, I again placed him in the chair and began to look over his mouth once more. Grasping the jaw with finger and thumb, I began slowly to pass backward and forward over the gums from cuspid to condyle of the jaw. In the region formerly occupied by the first molar, I found a small nodule which I had not before noticed, and which, upon pressure, I found gave great pain. Anesthetized patient and removed a good-sized

shot, together with a fragment of the maxillary process, which, being fractured, was evidently pressing against the nerve. Removal of the shot and fragment of bony process put a stop to the neuralgia.

Patient No. 3. Female, 37; married, greatly emaciated and anemic. Mouth full of badly decayed teeth, broken-down, abscessed roots, and pus galore. Gave a saline cathartic (liquor magnesii citratis) and a pus-evacuating agent (normal tincture of echinaceae) in the proportion of two drachms in a four-ounce mixture of water. Dose, one teaspoonful every three hours, and instructed her also to use the same as a mouth-wash. As an eradicator of pus, I find no agent its equal, and use it externally and internally. This patient had been for a long time suffering with toothache and had given her teeth no attention. After a few days' use of the tincture of echinaceae, I extracted the abscessed roots, and in due process of time looked after the remaining teeth. This patient needed a bitter tonic, and I prescribed compound tincture of gentian, one drachm three times daily.

Quite often it is necessary for us to call in our colaborer, the physician. With one patient, after prescribing a number of drugs, massaging and anointing with ointments and unctions, he one day presented with a tent or plug of cotton in his ear, complaining of earache. I called my physician, who, upon careful examination, found a perforated ear-drum, considerable infection, and a very marked otitis media. The clearing up of this infection cleared up the neuralgia.

A standard materia medica mentions about 125 remedial agents to be used in neuralgias. I have mentioned a few with which I have been successful. You have a large number left from which to choose so that your success or failure need not depend upon the adoption of any of the afore-mentioned.

While I am aware that cataphoresis had its day and has been relegated to the museums of antiquity (at least so far as dentistry is concerned), nevertheless, I have begun to use the blue ray for the relief of pain, and strictly speaking, any pain is a neuralgia. I should like to know if any of you here have tried this agent. The London *Lancet*, May number, quotes

Professor Redard as saying that he can "produce a condition of general anesthesia sufficiently profound for painless performance of an operation of short duration by using an electric light of 16 candle-power enclosed in a blue-glass globe, causing the patient to gaze into the light and enclosing both light and patient's head in a blue cloth, to the exclusion of other light." I do not know whether this agent has any permanent remedial action other than its anesthetic effect or not, but I do know, from personal experiment, that the effect will last from a half to a full day's length.—*Dental Summary.*

DENTAL CARIES. By J. V. Konzett, D.D.S., Dubuque, Iowa. Ever since dentistry has risen to the dignity of a profession, there has been controversy, of greater or lesser proportions, over the etiology of dental caries, and from the theory of inflamed dentin of the early fathers, to the theory of microbic invasion of the present day, theories have arisen, had their brief but strenuous day, and have passed into oblivion. But of the many theories that have engaged the attention of the profession from time to time, none has ever questioned the correctness of the position that the inherent weakness of the tooth itself was a large factor in the inception of decay. Not until Dr. G. V. Black, in his epoch-making papers published during 1895, demonstrated the fact that all teeth, whether from the mouths of those that were suffering from the greatest susceptibility, or from those that were immune, were practically of the same density, did the profession for a moment question the assertion that there were hard teeth and that there were soft teeth; that the hard teeth would resist decay and the soft would melt away as the snow before the summer sun.

Since Dr. Black gave us the results of his experiments and demonstrations, the profession generally has accepted the theory that caries of the teeth is caused by a microorganic invasion of the dental tissues, and that the density of the tooth itself has nothing to do with primary caries. But, while the profession, as a whole, has adopted this theory, there are some who still hold to the old theory of inherent imperfection or weakness, and as

some of these men are among the brightest minds we have in the profession, their opinions cannot be ignored. Such an one is Dr. I. N. Broomell of Philadelphia.

Dr. Broomell, in an article published in the *Dental Cosmos* of November, 1906, questions the correctness of the position of the followers of Dr. Black, and as any opinion of Dr. Broomell is worthy of our consideration, I wish, in the interest of dental science, to bring his ideas before you for consideration.

The doctor says: "Being fully convinced that cleanliness of the mouth is very much less important, as a combating factor in the etiology of caries of the teeth, than is generally supposed, and being equally confident that systemic conditions, through their influences over the hard structures of the teeth, are chiefly responsible for making caries possible," etc., and then says: "First let us employ a few commonplace arguments to strengthen the assertion already made, that cleanliness of the tooth surfaces does not insure immunity to decay of those surfaces." In these arguments, which follow, he cites the instances of savages and prehistoric races being practically immune to caries of the teeth, also the fact that many people who pay no attention whatever to oral cleanliness are immune; the argument being, that uncleanness in itself is not conducive to decay, nor cleanliness a prophylactic measure. Let us see whether we can coincide with his opinion, or not.

We believe that the work of Black, Miller and Williams has demonstrated the fact that caries of the teeth is caused by micro-organisms which are deposited upon the teeth in such places that are not reached by the tooth-brush or disturbed by the food in its excursions over the teeth during mastication; such places being the approximal surfaces of all teeth, the labio- and buccogingival planes and the deep fissures and pits found upon the occlusal surfaces. These organisms, according to Dr. Black, throw out a protecting gelatinous covering, under protection of which they secrete the acid, which attacks the tooth structure. If this is true, and who is prepared to refute it, then if these organisms were prevented from adhering to the surface of the tooth, there would be no decay. But Dr. Broomell may say, we find decay prevalent in those mouths that are habitually clean. Yes, but

they are not clean upon these surfaces, nor is it possible for a patient to keep these surfaces surgically clean. In order to do this, he must call to his assistance the prophylactician, who, by keeping these places clean, does prevent decay in those mouths that were, before, extremely susceptible. Dr. D. D. Smith's work is an illustration of this truth, and every man who has conscientiously followed Dr. Smith's methods can supply a multitude of illustrations from his own practice. On the other hand, the doctor points to the immunity in unclean mouths, and says that immunity must consist in some systemic condition. This is undoubtedly correct. No one has yet been able to tell why there are certain people that are susceptible to caries and others that are not; nor why one who is immune to-day, will be susceptible to-morrow; nor why there are recurring periods of immunity and susceptibility in the same person at different periods of his life, but it is a fact that such is the case.

Dr. Miller made a series of examinations of the saliva of susceptibles and immunes, and was able to find no appreciable difference, and yet, we must believe that there is a condition of the human mouth, at some time, that prevents the organisms of decay from attacking the teeth, and again that that condition changes so that the organisms may become pathogenic to tooth structure.

In the condition of systemic immunity, it is, of course, not necessary to follow out a course of prophylactic treatment, for the system will take care of its own teeth, but in this day, and in our civilization, these cases are so rare that they can hardly be reckoned upon; but in those cases that, by reason of some systemic fault, are susceptible, and these are the cases that constitute our practice, a thorough and frequent cleansing of all the surfaces of the teeth will prevent decay. Again, the doctor says: "A part of the argument which it is intended to present, and which is by no means news, is that the character of the tooth tissues has as much, if not more, to do with the production of or freedom from caries as any external local condition." He then cites the work of Dr. Black in determining the density of tooth structure, and states, as his belief, that the inherent weakness of the tooth itself has more to do with its destruction than any external factor, and it is at this point that I must entirely and absolutely disagree with Dr.

Broomell. Dr. Trueman pointed out the fact that the density, or the lack of density of the dentin had nothing to do with the inception of caries, as caries always began upon the enamel. It is the enamel, and not the dentin, that is concerned in the inception of caries, so that the work of Dr. Black, as far as it regards the density of the dentin, can be eliminated from this discussion. If there is a weakness of the tooth structure that invites caries, that weakness must be in the enamel, or if there is strength in the tooth structure that resists the invasion of the organisms of decay, that strength must reside in the enamel; and if there is in any one individual recurring periods of susceptibility and immunity, and these recurring periods are determined by the strength or weakness of the tooth, then it must follow that as the enamel is the protecting organ, the coat of mail, it must have recurring periods of weakness and strength. Unless we revise our views upon the histology of the tooth, such an idea is untenable. We are taught that the enamel organ envelopes the dentinal organ, or pulp, and that amelification begins upon the inner surface of the enamel organ, immediately upon the newly formed dentin, and proceeds from within, out. Consequently, when the tooth is formed and the enamel complete, the enamel organ has finished its work and disappears, and as there cannot be any farther activity of the enamel organ after the disappearance of that organ, I fail to see how the enamel is going to undergo vital changes of character tending toward either weakness or strength.

Dr. Sudduth says that enamel once formed, always remains the same, that in the nature of the case it must; as its formative organ has disappeared it cannot take upon itself any additional strength, and if it becomes weak, it must perforce remain so; and yet we see many recurring periods of weakness and strength, if we accept the theory of Dr. Broomell, as laid down above. But the argument might be made that the resistance of the enamel might come from the dental pulp. I, personally, cannot see how that can possibly be. There has certainly never been demonstrated a circulation in the dentin, and even though they might account for a strengthening of the enamel in some mysterious way by the dental pulp, I fail to see how they would account for a weakening in the enamel through the agency of the pulp, for we certainly can-

not suppose that cells analogous to the odontoclasts would penetrate the dentinal tubules and absorb a part of the enamel. But, admitting that there might be a possibility that the enamel might be affected through the medium of the pulp, how can we account for the fact that teeth in which the pulp has been destroyed act exactly as their neighbors do in periods of susceptibility and immunity? I have never noticed any difference in the behavior of a tooth without a pulp, in this respect, from that of one with a live pulp. When the patient was immune, the pulpless tooth did not decay; when the patient became susceptible, the pulpless tooth was just as liable as the one with the live pulp. From whence, then, does it receive its recurring strength and weakness? The enamel organ, the formative organ of the enamel, is gone, and the pulp, the formative organ of the dentin, is gone. That there are changes in the environment of the tooth, due to systemic conditions, we admit. In fact, upon this theory we account for the recurring periods of susceptibility and immunity, but that there are changes in the structure of the tooth, either as to the dentin or enamel, we deny. We believe that if a tooth from the mouth of a person immune to caries was placed in the mouth of one that was susceptible, that that tooth would decay just as rapidly as any of the teeth natural to that mouth. That defective enamel is not a cause, or even a large factor in decay, was demonstrated by Dr. J. Leon Williams of London in 1897. In his article, Dr. Williams shows that the enamel upon the teeth of races immune, or practically immune, to caries is just as defective, under the power of the microscope, as is the enamel upon the teeth of those suffering from caries, and farther, he showed that the enamel of animals entirely immune was also defective in a very large degree, and yet caries did not exist. In fact, in one case, the African porcupine, the enamel was so defective that great fissures ran clear through the enamel to the dentin, and yet Dr. Williams says that he has never seen a case of caries of the teeth in an African porcupine, demonstrating clearly that the structure of the tooth has little, or nothing, to do with caries, unless there is a systemic condition that allows the organisms of decay to operate, and even then these organisms must be able to plant themselves in an un-

disturbed position in order to effectually accomplish the destruction of the tooth.

In closing, Dr. Broomell says: "If there is any good practiced by Dr. D. D. Smith and his followers * * * the benefits derived are not the result of keeping the surfaces of the teeth clean, but rather from structural changes which the teeth receive." In this sentence, the learned doctor epitomizes the difference between his belief and that to which I hold. I fail to understand, as I have said before, how there can be structural changes, from resistance to non-resistance to decay and back again, time and time again, in the tooth, either as to its dentin or to its enamel; but I can understand and I believe that, with the light we now have concerning the structure of the teeth and the etiology of caries, that this is the only intelligent solution of the problem, how a tooth of stable structure can, at different periods of the life of its host, suffer from caries and be resistant to the influences of caries, this is the only intelligent solution of the problem, how gists are able to tell us just what systemic conditions make it possible for the organisms of decay to thrive and what conditions make it impossible, we may be able to control caries of the teeth through systemic medication, but until that time arrives, I believe it behooves us to practice the prophylaxis of Dr. Smith with the idea of preventing the bacterial plagues from obtaining a foothold upon our patients' teeth, and if we do that we will prevent decay.—*Tri-State Dent. Record.*

SALIVARY CALCULI. By C. B. Lockwood, F.R.C.S., England. Salivary calculi are inadequately treated in surgical works. Their causation is unknown; possibly they are of bacterial origin. They occur in the ducts of the submaxillary and of the parotid glands, and, it is said, in the ducts of the sublingual gland.

In calculus of the submaxillary duct the patient complains of discomfort and swelling beneath the jaw. A man who complained that he had some discomfort in his neck and that a swelling appeared there when he was eating, furnished a unique opportunity of seeing the early stages of the swelling. After he commenced to eat a considerable swelling appeared beneath the left side of the body of the jaw, in the region of the submaxillary gland. On

examining the floor of the mouth a small salivary calculus was felt slipping about in the left submaxillary duct.

Calculus in the submaxillary duct is easily overlooked, and may not be felt unless the practitioner knows how to feel. If the practitioner feels for these calculi by putting the finger into the floor of the mouth and pressing upon the duct they slip down into the dilatation of the submaxillary duct, or into the submaxillary gland itself, and he fails to detect them. The method to be followed is the same as that for feeling for carcinomatous enlargement of the glands in the floor of the mouth. Insert a gag, if necessary, to prevent the patient from biting the fingers. Put one finger outside the floor of the mouth and another inside. You may not feel a calculus at once, but by pressing the fingers together you will find the calculus slipping about.

If a calculus has existed for any length of time in the submaxillary duct it will cause inflammatory changes, so that the sublingual papilla through which the mouth of the duct opens is swollen and perhaps red. Sometimes the inflammation spreads to the side of the tongue.

Another form of mistake was made in the following case: A calculus, three-quarters inch long and one-half inch in diameter, was stuck in the anterior end of the submaxillary duct, beneath the sublingual papilla. The patient was supposed to have an epitheliomatous ulcer in the floor of the mouth. There were the ulcer, the surrounding inflammation, and beneath the jaw was a lump which would correspond to the infected glands of epithelioma. But one or two points led the writer to suspect that there was not epithelioma. There was a history of a very long period of discomfort in the floor of the mouth. The lump was vivid red and looked inflammatory. The ulcer was small and seemed accurately located to the opening of the submaxillary duct. When a probe was passed into the floor of the ulcer a calculus was felt. The glands under the jaw were large and slightly tender and the submaxillary gland was inflamed.

For removal of a calculus general anesthesia is necessary. The patient was anxious not to have a general anesthetic, and that the calculus should be removed under cocain anesthesia. When the writer cut into this inflamed mass to try to extract the calculus the

mouth became full of blood. When he became aware of this bleeding he was alarmed and shut his mouth, hence the attempt failed.

The following case is a warning not to be too positive as to the curative effects of operations. A man came with the usual history of salivary calculus and one was found slipping about in the left submaxillary duct. It was removed. Two years afterward he returned with two calculi slipping about in the same duct. The patient was under the anesthetic from half to three-quarters of an hour and the writer, with great trouble, tried to open the submaxillary duct and get the calculi to slip out, but they disappeared, and he could not find them again.

Calculi may arise not in the duct but in the gland, and those which slip out of the surgeon's ken may have disappeared into the gland whence they came. A young woman had great enlargement of the submaxillary gland. It felt exceedingly hard and aroused suspicions of cancer. However, a salivary calculus was felt in the submaxillary duct near the posterior edge of the mylohyoid muscle. The submaxillary gland felt so intensely hard, and it was so unlikely that it would ever return to its proper size that the writer removed it and the calculus. The gland contained many small calculi and was full of grit. This shows that in some cases salivary calculi arise in the substance of the gland.

Thus the removal of submaxillary calculi is not an easy operation. A general anesthetic and careful preparation are necessary. The operator has one finger outside the mouth and another inside, so as to have better control. It is important to have an efficient gag on the opposite side and an assistant to pull out the tongue. With the gag well placed and the tongue well under command, cut down on the calculus in the floor of the mouth and get it to slip out of the duct. It is difficult to fix the calculus. It is of no use pushing down—the calculus slips away into the dilated part of the duct. By getting an assistant to push with his thumb underneath the angle of the jaw, so as to push the submaxillary gland and duct up and fix the floor of the mouth, the calculus may be steadied against the body of the lower jaw. Then the duct is incised and the calculus slips out. A little gauze packing is placed in the wound. Should it be desirable to remove the submaxillary gland, a semilunar incision through the skin, platysma and deep fascia of the neck, division of

the facial vein and facial artery and submaxillary duct are necessary.

The diagnosis of calculus in the duct of the parotid gland is not easy. A girl, aged 10, came to the hospital with a swelling of the left parotid region. It was said that it varied in size; that it became a little bigger when she stooped, and that pressure made it disappear. Various operations were suggested, but the writer was averse to making a cut upon the face of a little girl to cure a cyst, the existence of which he was not certain. After the consultation she went back to the ward, and the dresser made a discovery. He felt a calculus slipping about in the parotid duct. She had been examined over and over again by surgeons and assistant surgeons, but none could feel this calculus. The removal of this small calculus had then to be undertaken. The child was anesthetized and the gag adjusted, and the writer began to feel for the calculus in Stenson's duct. For a long time he could not feel it. At last, by squeezing the parotid gland rather hard, it was felt to slip forward. Acting upon the knowledge that he had acquired in removing calculi from the submaxillary duct, he tried to fix it against something. He fixed it against the coronoid process of the lower jaw and managed, with a curved knife, to cut down upon it, and it slid, almost by chance, into the mouth.—*Clinical Journal*.

A SIMPLE METHOD OF CONSTRUCTING PROXIMO-OCCLUSAL GOLD INLAYS. By D. M. Gallie, D.D.S., Chicago. The interest manifested by the profession in gold inlays has brought to our attention many ingenious and accurate methods of construction. Some advocate the burnishing of the matrix in the cavity; others the swaging over models; many believe in the solid inlay, while others advocate the hollow. All methods have a just claim to recognition and all have their particular place.

The large molar restorations, involving one or both proximal surfaces, and part or all of the occlusal, call for the hollow inlay, with its carved and swaged cusps and proximal surface soldered to the matrix.

There are many cavities in the proximoocclusal surfaces of bicusps and molars for which inlays can be made much easier, much quicker, and just as artistic and accurate by the following

method. (This method is not original with the writer; it is the method advocated and used by Dr. D. A. Hare, of Chicago, and many others):

Sufficient separation must be obtained so that when the inlay is completed and in place the mesiodistal diameter of the tooth will be the same as before the destruction of the tooth surface by caries.

The cavity should be prepared so that resistance form is given to it, and walls so prepared that an impression can be taken of cavity without distortion. A suitable impression tray is improvised and an impression of the cavity taken in modeling compound. This should be thoroughly chilled before removing. If, upon removing, the impression shows any signs of pulling or distortion, the excess compound should be trimmed away and the impression resealed into the cavity with the aid of warm water. Chill again and remove.

A model can immediately be obtained by the use of Spence or some other low-fusing metal, which can be run into the compound impression.

Separate and invest model in dental-lac ready for the swager. Now take pure gold, 36-gauge, size of piece suitable for the cavity, and partly burnish into model and then use the swager. Trim matrix to margins of cavity, and, allowing a slight overlap, again burnish thoroughly against all walls and over margins. So far this operation, from the taking of the impression to the swaging of the matrix, has taken about ten minutes, consequently the patient can be left in the chair. Now take the matrix and try it in cavity in the mouth, and if necessary burnish in the natural tooth. Fill the matrix with sticky wax and have patient bite. With warm spatula shape up the proximal surface and trim off excess wax on occlusal. Care should be taken to have marginal ridge reproduced in wax. Chill and remove wax and matrix from the cavity; smooth over any unevenness that may be on proximal surface and be careful that no wax extends beyond the edge of the matrix.

Now take a piece of platinum .001 thickness and burnish over wax proximal surface, attaching it to the wax by the aid of a warm burnisher lightly passed over the platinum. Trim even

with margins of gold matrix and the wax on the occlusal surface at the marginal ridge; paint underside of matrix with whiting, and invest. When hard remove sticky wax and trim investment down as small as possible.

Direct the flame of the blowpipe underneath the investment, drop solder into the matrix. Use either 22 karat, 20 karat or coin solder. The latter is very good on account of color and flows readily. When the gingival three-fourths of the matrix is filled with the solder direct the flame to the top of the investment and finish the soldering. The solder naturally flows to form a concave surface, such as we desire for the occlusal. When cool remove from investment, and we have an inlay with the proximal surface covered with .001 platinum. With stone and disk this can easily be removed without affecting contour or contact point.

When soldering use a minimum amount of borax, and that should be perfectly clean.

Three-surface inlays can be made by this method as easily as two-surface, and if cusp restorations are required this can be accomplished by sweating on the gold to form same.—*Dental Summary.*

PYORRHEA ALVEOLARIS. By T. A. Hardgrove, D.D.S., Fond du Lac, Wis. Under the head of etiology and pathology, I will attempt to enumerate some of the abuses and conditions that seem to me to be responsible for this malady, and which are not receiving the amount of scientific research that the importance of this disease demands. Pyorrhea, in the beginning, does not intend to be other than a harmless temporary disease, but through failure on the part of the patient to give heed to its presence on account of absence of pain and a lack, too, upon the part of the dentist to make an early diagnosis and institute prophylactic measures to check its progress, it is further encouraged upon its excursion of pericemental destruction and tooth exfoliation, until it is too late to save at least the teeth that have been extruded and cast off.

It is impossible to single out any one cause as the one to which to attribute pyorrhea alveolaris, as it is, I believe, due to a combination of pathologic conditions. This disease comes as a result

of a dying pericemental membrane, caused by a depraved pericemental circulation, as the result of an injury received either from traumatic, chemical, bacterial or systemic causes, aided by local conditions, any and all of these giving rise to an inflammation by which we get an engorgement of the blood vessels, partly by the inflammation present and as the apparent result of loss of control of the nerve endings that have to do with the circulation at those locations having then reached an inflammatory stage where an epithelial exfoliation takes place, acting as a nucleus and furnishing a roughened place for the formation of the so-called tartar, or more properly, a concretion. The exudate of blood plasma is now present, as it is attracted to locations where inflammation is at work. The deposit adds to itself from such salts as are then present, the relative hardness depending upon the amount of mineral salts entering into its composition.

The formation of deposit will take place in whichever way the pericemental membrane will die first or in whichever direction the field is ready to receive it. Having now the mechanical irritative advantage of the deposit to aid the progress of the disease, the blood and plasma being present in larger quantities, a suitable media or pabulum is prepared, the pus organism steps in and infects the material that is present, dissolving the albuminous portions, leaving behind it the salts to crystallize and form the deposit, and, as the albuminous portion is dissolved and broken down in the form of pus, the salts that are not soluble take form and we get pus sinuses with pus flowing from them and we have true pyorrhea alveolaris.

By traumatic causes, I mean such as would come from an overworked pericemental membrane or an overworked portion of the membrane due to an improper occlusion, or as the result of accident.

Dr. C. S. Case of Chicago, I am told, has made the statement that he has cured pyorrhea by the regulation of irregular teeth, and I believe he is justified in the assertion, for by the regulation of the teeth by his marvelous skill he produces a normal occlusion, giving to each tooth its proper amount of exercise. Let me illustrate. Take a certain number of horses and give them just enough exercise to keep them all in normal health. Now, if you

were to allow one or two of them to remain idle in the stall, the horses standing idle would in time show signs of broken health, not so soon, however, perhaps as the horses overworked from doing extra work placed upon them because of the idleness of the horses left in the stall.

By chemical causes I mean such fermentation of food products as may in a protected location cause sufficient irritation to induce abnormal capillary circulation, thereby producing an inflammation. Bacterial causes consist in the introduction of the pus organism and such other bacteria as may produce an inflammation. They may be tubercular, diphtheritic and the bacteria known as actinomycosis and syphilitic, if the latter be a bacterial disease.

Systemic causes are not so numerous as many of the profession would lead us to believe. I am not sure that there are very many systemic causes contributing to the origin of this disease aside from tubercular and syphilitic conditions. Were you to ask me if I did or did not believe that diabetes or Bright's disease is present with pyorrhea, I would answer that I thought they oftentimes were. Were you to ask me if I thought them responsible for the disease, I would say they are not. I believe that many of the so-called systemic causes are but the result of the disease rather than the cause. I have many times known of sugar and albumen in the urine of people afflicted with pyorrhea alveolaris to disappear entirely in some cases and a great many times to be lessened when the pyorrhea has been relieved, and what is more reasonable than to suppose that pernicious anemia which is said to consist in a great destruction of red blood cells in the liver as the result of poisons taken up by the portal circulation from the intestinal tract, may be due to infectious by-products emptied into the intestinal canal from the mouth cavity? So much importance is placed upon this idea of infection from the mouth that few surgeons undertake intestinal surgery in this age without first insisting upon a thorough sterilization of the oral cavity, and it is said by many that one great cause of appendicitis may be attributed to infections coming to it from that source.

Prognosis and Treatment.—Pyorrhea alveolaris is both a preventable and curable disease. The length of time usually required to establish a cure is from three to four weeks after a tooth has been

treated. So far as checking the disease is concerned, that part of the cure takes place immediately after the operative interference, the balance of the time being required by nature for granulation, regeneration and organization. The treatment of this disease should be approached just as any minor surgical operation.

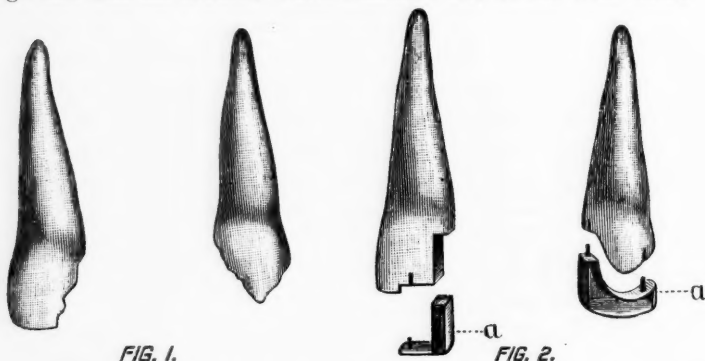
A careful examination should be made with a delicate instrument, called deposit finder, not so much for diagnosis as to determine the extent of the disease. Having that carefully done, you will anesthetize the field of operation with one-half of one per cent solution of cocain hydrochlorid released from a large-sized hypodermic syringe through a long blunt-end flexible needle, using rolls of cotton on each side of the alveolus to absorb the excess. With a carefully selected instrument, one that will pass beyond the deposit, remove it with a pull stroke, if possible; if not, with a push stroke. The deposit must be removed at any rate. With the deposit positively and carefully removed the pus sinus should be flooded with a warm solution of lactic acid containing a slight amount of oil of sandalwood. This fluid has two functions to perform: The dissolving of small particles of concretion that we may not have been able to detect with the instrument and a cauterization of the walls of the cavity. The object in using lactic acid in preference to the other acids is that it cauterizes just enough to induce granulation and not enough to destroy the vitality of the surrounding tissue. Oil of sandalwood is placed in the solution for its effect upon the mucous membrane and as an aid in the solution of the small particles of concretion. The tooth or teeth operated upon should be ligated to the adjacent teeth to obtain as much rest as possible, and that part of the work left alone for three or four weeks. I do not believe it is wise to polish with pumice until three or four weeks have elapsed. By that time union will have taken place and there will be no danger of the pumice working down into the pus cavity between the gum and roots of the teeth, acting as an insoluble irritant. Oftentimes the pus cavity will have a small opening and a large or expanded termination. In these cases it is good practice to make an opening at the termination of the sac, allowing the irrigating fluid to pass through and for the purpose of drainage.

A massaging of the roots and gums should not be begun until five or six days following the operation. The object of waiting that

length of time is not to interfere with the granulation that is taking place. The patient should be instructed with reference to oral hygiene and provided with antiseptic, stimulating and astringent mouth-washes and a tooth powder, if considered necessary, containing not too much of the gritty substance.

Following this procedure, and with the cooperation of our patients of average intelligence, this branch of our work becomes a most attractive, gratifying and profitable field of service.—*Dental Review*.

COMBINATION GOLD AND PORCELAIN INLAY. By A. J. Johnstone, D.D.S., Anderson, S. C. A lad thirteen years of age met with an accident which fractured two of his front teeth,



left central and lateral incisors. These teeth were fractured as indicated by Fig. 1.

Pulps were not exposed, neither were the teeth decayed. The question with me was how to restore the corners of these two teeth and yet not destroy nor expose the pulps. At the age of thirteen I do not consider it advisable to destroy pulps if it is possible to avoid it. In this case had I excavated much I would either have exposed the pulps or have encroached so near them that they would have died by thermal shock.

Porcelain tips or corners would not in my judgment and experience have withstood the masticating stress.

Solid gold inlay corners would have been strong enough, but very unsightly, and therefore to be avoided. Jacket crowns would

in my judgment have been impracticable. So after giving the case considerable study, I determined to treat in the following manner: With suitable disks the walls of the teeth were ground, as shown in Fig. 2, and hollow gold inlays were made and cemented to place; then a porcelain inlay made to fit the labial opening in each gold inlay. This gold inlay is better described as a box, the lingual side only being of gold and made to occlude with the lower teeth.

I was very well pleased with the operation when completed, and

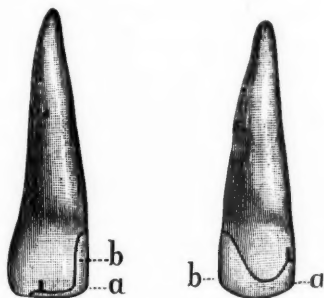


FIG. 3.

obtained almost the strength of a solid gold inlay and nearly the beauty of a porcelain inlay. I may add that one could use "Ascher's Cement" instead of porcelain if this cement proves as good as promised by the manufacturers. These two teeth have been very satisfactory up to date, and from all indications will prove quite a creditable operation as to service.—*Items of Interest.*

SOME ESSENTIALS IN COMPARATIVE ANATOMY.

By H. A. Fynn, D.D.S., Denver, Colo. The primordial type of teeth was a simple cone.

Remove the point of this cone and the result is a truncated cone.

Fuse two, three, four or five of these together and we have the complicated patterns of the higher orders of animals represented by the bicuspid and molars of mankind. The higher class, however, represents a very small percentage compared with the lower orders, which remain constant to the original type. In man, teeth are merely accessories—useful in a way for excising and masticating food, but not of vital importance, for it is possible for human beings

to live without these adjuncts; but among the lower animals they are absolutely necessary—their very existence depending upon these organs, they being required not only in obtaining food but as weapons of offense and defense; so, if for any reason they prove defective, the owner quickly falls a victim to those who are better provided with these very useful weapons.

The true cone is found in all fishes, reptiles, lizards and in many higher orders, in slightly modified form. With a slight backward curvature it serves their purpose admirably. Being carnivorous, compelled to catch their prey while alive, these teeth are perfectly shaped to fasten upon and hold the slippery, struggling fish or animal which has been caught; its very struggles serving to more firmly impale it. Many of this type have also a hinge joint which permits these teeth to lie horizontally backward, offering no obstacle for the ingress of food, but upon the slightest touch assuming an upright position, preventing the escape of the poor victim.

We are inclined to formulate a definition of teeth as we see them in the mouths of our patients or from our slight knowledge of the dentures among the domestic or semi-domestic animals. Teeth firmly fixed in the inferior and superior maxillary bones, usually consisting of two sets, a temporary or milk and the so-called permanent set, the latter supposed to serve the wants of the individual throughout its lifetime. The purpose of these is the excising, tearing, and masticating of food. In man, they also assist very materially in articulate speech. From our special point of view we are inclined to regard the function of the jaws as primarily for the accommodation of the teeth, forgetting that the mandible especially has a much higher office, almost a vital function, in assisting deglutition and respiration.

Those animals in which the function of mastication is paramount are few compared with those in which the teeth are used principally as weapons. War is universal. From the lowest plant to the highest mammal, the strong are eternally preying upon the weak. This, with the survival of the fittest, is nature's law, and the teeth play a very important part in the result.

In this struggle for existence they have become highly specialized, as the extraordinary development of that magnificent weapon in the male wild boar, the cuspid, or with the central incisors in the

male elephants and the left central in the narwhale, which attains a length of eight or ten feet. These are purely weapons of warfare and of no use in the mastication of food.

Another beautiful example is found in the development of the poison fang among the reptiles. Originally, probably all reptiles had the same number and kind of teeth—two rows on the upper, and one on the lower jaw. Their habits were largely similar. Their prey was seized, held firmly on these recurved teeth, and gradually swallowed. Then, perhaps, there came a time when a certain species was in danger of extinction. This might be brought about from scarcity of food and too much competition, climatic conditions, or depredation from enemies. Nature, for some reason, wanted to continue this particular species. To do this it gave it an especially long tooth known as a fang; perhaps, this not proving sufficient, she grooved this fang on the inner side to convey poisonous saliva into the wound. It is a short step from the grooved fang to the hollow fang and from the poisonous saliva to the gland containing the poison which is injected through the fang into the wound, as in the case of the common rattlesnake. As I have said, the non-poisonous snakes must seize their prey, hold, and swallow it. The poisonous simply lies coiled until its victim comes within reach, when it strikes and lies quietly back, knowing the animal can be found dead within a few feet and can then be swallowed at leisure. Now the remarkable thing about all this is that with the development of the poison fang the other teeth on the upper jaw, being no longer of any use, have completely disappeared. Another beautiful phase of this specialization is that two fangs are developed simultaneously lying side by side, horizontally. When the snake prepares to strike, one is erected and generally broken off in the act; the other, however, in a very short time takes its place and, to maintain the supply, eight or ten more are in process of development on the inner side of the jaw.

As another example of the absolute degeneracy of the teeth, one species of snake in Africa lives entirely in trees and feeds upon the eggs of birds. Here again the teeth are useless and have practically disappeared, but two little spinous projections have developed in the throat which break the shells in swallowing, permitting them to reach the stomach in the best possible form for assimilation.

The turtle and tortoise have no teeth, but a remnant of a tooth band, which may have been the means of supplying them with these organs at some prehistoric time. Birds have no true teeth, but fossil remains show they once possessed them. These same so-called lower orders have a great advantage over the higher in the successional teeth, these teeth forming along the inner side of the jaws, passing up over the border, there attaining their highest usefulness—after serving their purpose being cast off and new ones taking their place. This dentition is found in the fishes, reptiles and lizards.

Another fine provision in animals is found in those in which the teeth grow throughout a lifetime from persistent pulps. This condition is found in those orders where there is extraordinary wear, as in the rodents—rats, rabbits, squirrels, beavers, etc., also in the tusks of elephants. With these tools, a squirrel can quickly gnaw through the hardest nut, a beaver fell a large tree, and a rat has been known to gnaw through an iron pipe to obtain water. From these examples it would seem as if nature had given to each family, excepting man, the best possible dentures, serving their purposes perfectly, assisting in propagating each species, not only assisting but making such propagation possible.

As the teeth of these animals are marvelous in their perfection, marvelous in their specialization for certain things, they are equally marvelous in their degeneracy when, for any reason, they have outlived their usefulness. The teeth of man are excellent examples of degeneracy; degeneracy in structure, degeneracy in shape and occlusion, degeneracy of retention in the alveoli. And this degeneracy is not confined to the teeth, but extends to the upper and lower jaws, the muscles of mastication and the accessory muscles. In fact, we have the jaws and muscles of a child in the head of an adult.

According to Haeckel and others, our ancestors 3,000,000 years ago first appeared upon this earth during the Eocene period of geologic times. They possessed 44 teeth, consisting of three incisors, one cuspid, four bicuspid and three molars on each half of each jaw. They were characterized by the small size, imperfect structure of the brain, which had not become a true organ of thought. They all had short legs and five-toed, flat-footed feet.

From these, unquestionably, have come the entire family of primates, consisting of apes, monkeys, lemurs, etc., and from these in turn has come man.

Whether we are directly descended from the apes or from another line similar to the apes makes but little difference, it is true beyond a doubt we had a common origin. Haeckel says that comparative anatomy proves to the satisfaction of every unprejudiced and critical student the significant fact that the body of man and that of the anthropoid ape are not only peculiarly similar, but that they are practically one and the same in every important respect. The same 200 bones, in the same order and structure, make up our inner skeleton; the same 300 muscles affect our movements; the same hair clothes our skin; the same groups of ganglionic cells build up the marvelous structure of our brain; the same four-chambered heart is the central pulsometer in our circulation; the same 32 teeth are set in the same order in our jaws; the same salivary, hepatic and gastric glands compass our digestive process; the same reproductive organs insure the maintenance of our race.

Man, at this time, had a retreating forehead, small brain development; the upper and lower maxillary bones were extremely prognathous. He was omnivorous, living upon fruits and vegetables when procurable, but not at all adverse to a meat diet. He possessed possibly 38 teeth, like the New World monkey of to-day, or 32, like that of Africa. He preyed upon other animals, seizing them with his hairy claws and cuspid teeth and devouring them as soon as killed. He was a rival to the cave bear and similar to him in his habits.

During thousands of years there was a gradual development of the cerebrum. From instinct—and this instinct comprised three things, preservation of life, obtaining food, and propagation of his species—there was being gradually developed a reasoning faculty. As a result of this reasoning, he one day made an invention, and from that time to the present day he has been king of all the animal kingdom. That first invention was the bow and arrow, and some one has pronounced it the greatest of all inventions, for it demonstrated the superiority of man over all other animals. With this weapon it was comparatively easy for him to obtain food. It could

be killed at a distance and eaten at leisure. It was no longer necessary to pursue, spring upon, tear to pieces and devour his prey.

Man had become master of the situation and lord of all creation. From this invention came others—fire at first to keep him warm, then to cook his food; a crude sort of clothes to protect him from the cold and storms; a family circle in a very limited way, and a simple means of communicating one with another by sounds and signals.

His progress now becomes rapid. He is able to build a sort of hut of earth and stones, the precursors of the houses of today; he takes precautions against the winter by storing food; he is learning to till the soil in a very crude fashion, and some sort of tribal relations may exist. He is beginning to domesticate animals. From this point it is but a short step to man as we know him today. To account for all this it is only necessary to note the great development of the frontal lobes, and with this development has come a corresponding shortening of the jaws, which shortening is going on today. This degeneracy manifests itself in lessening the body, the ramus joining that part at more nearly a right angle.

Of his 38 teeth, six of them have disappeared, and four or six more are now in process of disappearing. But those six may manifest themselves occasionally in the form of rudimentary teeth. The long, strong cuspid of our ancestors has been greatly modified, but the shapes of the others, excepting the third molars and upper laterals, are practically the same as they were thousands of years ago. Dr. Michaels of Paris believes that they have not perceptibly changed for 30,000 years.

Dr. Thompson, in a most thorough examination of the skulls of the Mound Builders which are scattered throughout the Middle West, found the teeth in those skulls differed but slightly from those we see every day. These prehistoric people were subject to many of the lesions which affect the race of the twentieth century. Impacted third molars were common; caries occurred in some, and considerable indication of pyorrhea was found in many others. But one thing stands out very prominently, and that is the decided prognathous shape of the jaws, showing that the shortening of the body of the bone has been accomplished during comparatively recent years.

I believe that this is an important fact to us as dentists. If, as Dr. Talbot says, the jaws have shortened from one-half to one inch during the past thousand years, then the harmony in the lines and contour of the face must necessarily have changed also, so that in the twentieth century we have an entirely different type from that of a thousand or two thousand years ago. The old Grecian type would not at all typify the German, Russian, English or American people of today. A type of any of these would show more brain development, more rugged lines in the face, more character, more ability and an infinitely superior class. In fact, the old head and face which Greece considered perfect would be considered rather incipient today, except among the Latin races. It lacked the development of the frontal lobes.

Now, it being true that the jaws have shortened, the teeth remaining practically the same size, would account in many instances for the irregularity which is so common today. If the jaws are in harmony with the balance of the face, then it surely would not be good practice to expand the arch, for that would destroy the symmetry. And as two things cannot occupy the same space at the same time, and there is not room in the jaws for all the teeth, and as space must be obtained somewhere, is not extraction indicated? In extracting are we doing anything more than nature is constantly doing where she fails to produce an upper third molar or lateral incisor? I know this is opposed by the modern orthodontist, whose creed is never to extract, nor do I, excepting in those cases where, as I have suggested, it is indicated. When I see a child emerge almost a nervous and physical wreck from a year or more of torture by expansion of arches, and when I know space could have been obtained by extraction of one or more bicuspid and nearly, or quite, as good results obtained in a few weeks, I am compelled to ask myself, does it pay? No one is a greater admirer than myself of the magnificent work the orthodontists are doing, but, in my estimation, they are going to extremes in many cases. I ask them to remember that the jaws have shortened from one-half to one inch, while the teeth are practically of the same size as before this shortening. If nature herself, by prevention of development, is practically extracting teeth, why is it not good practice for us to do likewise? Dr. Bebb says: "If we could produce a type specimen of a skull from

which man has descended, it would be impossible to find among living subjects a single specimen involving the teeth not in malocclusion, in which there was not a deviation from the normal, and which no amount of mechanical procedure could restore to normal."

The bones of the maxillæ tend more easily to this variation than the teeth and many times the jaws will be in absolute harmony with the balance of the body, but the teeth furnish the deformity. Extraction in these cases is not only permissible, but demanded.

Another form of degeneracy is manifested in the narrow and contracted arches—more from this cause than from mouth breathing or any other cause, and as a result, hypertrophy of the nasal bones and polypi of the mucous membrane.

It would seem that this degeneracy, to a great extent at least, is normal and purely the result of evolution; our habits, our civilization greatly assisting. It is easy to understand how lack of exercise in the jaws and muscles of mastication would greatly assist in obtaining these results.

During the early history of the race, we were compelled to masticate the hardest and toughest kind of foods, now they come to us soft and tender, ready for swallowing and, in some cases, partly digested; as a result, the jaws and muscles, not getting sufficient exercise, atrophy. Irregularity also assists in producing this result. It is impossible to keep this class of teeth properly cleaned—the result is caries—the result of caries and malocclusion is inability to triturate the food properly and it is bolted. The whole series of conditions forms a vicious circle.

The thing to be learned from all this is, that we are victims of degeneracy through evolution, that it is the fate of our race and nothing can change it. What the outcome may be is uncertain. Will we ever become edentulous? Not in a thousand years, but who can say what will be our condition in ten, twenty or fifty thousand years? Whether we will or will not depends largely upon the dentists of the world. All must admit that we do not properly care for our patients now. The fault is with both patient and operator. The time is surely coming when, with the cooperation of our patients, we will not permit one of them to lose a tooth from caries, pyorrhea or any other pathologic condition, but the teeth will be preserved in comfort and usefulness throughout the lifetime of

the individual. This is "a consummation devoutly to be wished." We may then have fewer patients, but will take better care of those we have. Prophylaxis will be our guiding star and we will accomplish far more in prevention than in restoration—*Dental Brief*.

SILICATE CEMENTS. By George Edwin Hunt, M.D., D.D.S., Indianapolis. Silicate cements are at present sharing the center of the dental stage with porcelain and gold inlays. It may be worth while to compare their composition with that of the zinc phosphate cements before considering their use. The powder for a zinc oxyphosphate cement is calcined zinc oxid, finely comminuted and pigmented with oxids of other metals, as copper, iron, mercury, gold, silver and a compound of aluminum-cobalt (Ames). The liquid for the best grades of zinc oxyphosphate cements and for the silicate cement is, to the best of my knowledge and belief, the same. The difference lies altogether in the powders. Differences in zinc oxyphosphate cements, as put out by various manufacturers, are mainly in the composition and treatment of the liquid, although the fineness or coarseness of the powder will influence the setting properties to some extent, a coarsely ground powder setting more rapidly than one finely comminuted.

In Germany the use of silicate cements in dentistry has extended over fifteen years. In 1892, unless my memory is at fault, I first saw silicate cement fillings in the mouths of patients recently returned from an extended visit to Germany. These fillings were of a muddy color, about the shade of Portland cement, and so dense it was well-nigh impossible to make an impression on them with a bur. Where months of mastication had exerted its effect on occlusal fillings, they were cupped some, but the material still came up flush with the cavity margin.

From the above it will be recognized that silicate cements are not new at all, the present interest in them being due to improvements in coloring, rendering them adaptable for use in positions where they are exposed to casual view. This pigmentation is probably accomplished by the use of the oxids of metals. Doubtless, too, the improvement in cement liquids has rendered these later cements superior to those of past years.

There are several silicate cements on the market, and their gen-

eral characteristics under manipulation are quite similar. I have had experience with but two, Schoenbeck's and Ascher's. A recent writer on the subject claims the Ascher powder to be about fifty per cent kaolin, twenty-five per cent silicium (Query, silicon oxid?), twenty-five per cent calcium oxid, two per cent magnesium and a little beryllium. As he goes on to say that this formula is "almost the same as porcelain body" and as the basic principles of porcelain body are about four per cent of kaolin, about thirteen per cent of silex, and the bulk of it feldspar, with no beryllium and no calcium oxid or magnesium unless glass is used as a flux, my confidence in the accuracy of his assertion is considerably below par.

Another writer, in whom I place greater confidence, says the Ascher powder is aluminum silicate, with a slight quantity of beryllium in it, and that the use of beryllium forms the basis of the Ascher patents. He states that the silicon, beryllium and aluminum oxid are fused at a very high temperature and the resultant mass ground to an inert, amorphous powder; that the cement resembles a hydraulic Portland cement with a binder of metal phosphates instead of hydrates; and that the cement may be cited as an aluminum orthophosphosilicate, calcium and beryllium. Whether this be true or not the manufacturers alone can say and so far they have said not. In their circular of information they state that the powder contains about fifty-four per cent of silicon and other "light and practically unknown metals," including beryllium.

Glucinum is a comparatively rare alkaline earth metal element of the magnesium group, found associated with silica and alumina in the emerald, which is a double alumina and glucina silicate. The more common metal—beryl—has a similar composition, but is of a paler green color, owing, probably, to the presence of iron. Glucinum and beryllium are very similar to aluminum in their physical properties. Beryllium has had no place in the arts until recent facilities for producing extreme high temperatures have rendered it of practicable service.

The directions for mixing are practically the same for Schoenbeck's and Ascher's cements and they are the methods employed by all intelligent cement mixers. The liquid should be gradually

modified with the powder and each addition of powder thoroughly spatulated until the mass is perfectly smooth, before more powder is added. The first Ascher powder incorporated in the liquid appears to promptly dissolve without spatulation. This is not so marked with Schoenbeck's. The completed mix should be smooth and stiff. Experience has shown that approximately one grain of the powder to one minim of the liquid makes a perfect mix, three grains of powder and three minims of liquid being enough for an ordinary sized filling. I do not consider measuring the powder and liquid as a matter of great importance, however, as with an excess of powder on the slab and experience in making the mix, the operator readily realizes the proper consistency by the working of the mass. Only bone, ivory or glass spatulas should be used in making the mix, metal spatulas being almost certain to discolor the mass. The Schoenbeck cement has a decidedly gritty feel under the spatula, a character only lost after extended spatulation. The Ascher more quickly develops the smoothness indicative of a homogeneous mass. While both are sticky, the Ascher is more sticky than the Schoenbeck.

The completed mix should be inserted in the cavity by means of bone or ivory spatulas, pressing it well against the cavity walls and margins. Difficulty will be experienced in withdrawing the instrument from the mass without pulling it away from the cavity walls, but a little patience, combined with the coaxing effect of shifting wrist motions, will overcome that. As pressure is necessary to secure the requisite density and adaptation, the matrix should be used whenever indicated. Dr. John Q. Byram contributes a practical hint at this point. Coat the matrix with collodion by either dipping it two or three times, allowing it to dry between dips, or painting the collodion on with a brush. A stiff mix, such as should be used for fillings, will stick but little to this and even if it does it will be the collodion that will give way on removal of the matrix from the hardened filling and the collodion will be removed in finishing the filling. A fluid celluloid, an acetone solution, such as has been recently put on the market, would doubtless serve equally as well.

As the filling begins to harden, it should be condensed with bone, ivory or agate burnishers, preferably the latter. For this

purpose the working points should be coated with vaselin or soap-stone, the former giving the better results. Manipulation during condensation should be from the center toward the margins, as the stickiness of the material is so great that even with vaselined points there is danger of drawing the cement away from the cavity wall. Simple fillings, involving but one surface, may be finished as they harden with agate or tortoise shell instruments or with celluloid strips, coated with vaselin charged with pumice stone, or, if the mass is not too hard, celluloid strips with vaselin alone. While it is contrary to the advice given, I have not hesitated to use sharp, thin, steel instruments, coated with vaselin, to cut away superfluous material as it hardens, always cutting from the center toward the periphery to avoid dragging the material from the cavity margins. The further directions are to wash the surface with alcohol to remove the vaselin. Chloroform is still better—dry it with cotton or hot air, the latter hastening the setting, and cover well with melted paraffin. Schoenbeck says to varnish it. The directions from each manufacturer are to keep the filling perfectly dry for at least fifteen or twenty minutes after inserting it. If you will clean your mixing slab and instruments while the unused material is still plastic, you will readily see the necessity for observing this point, for the mix disintegrates and is removed by water much as a similar amount of plastic Portland cement would be. The resultant filling, if the above directions are carefully carried out, is a vitreous mass, approximating the appearance of enamel, indissoluble in either acids or alkalies, far in excess of strengths ever found in the mouth, and with good wearing qualities under attrition. I have heard rumors of the silicate cements dissolving under the influence of mixed saliva, but I believe if they do it is due to imperfect manipulation or to the filling being wetted before it has thoroughly crystallized. Under a Codrington lens the surface shows vitreous and dense. Fillings made in glass tubes are of a beautiful finish where the material was in contact with the glass, which leads one to suppose that if the filling could be finished, margins and all, and allowed to set without the subsequent necessity of disking, it would have an ideal surface. Maybe some of you can accomplish that, but I cannot.

Anyone who uses the silicate cements under the belief that they

are time-savers will be disappointed. They require more time than any zinc oxid cements, both for manipulation, setting and dressing. Every step in their use requires great care.

Dr. Alice Harvey Dudem called my attention to one feature of Ascher's, which observation in our college clinic corroborates. It bleaches two or three shades in the course of a few weeks. Due allowance should be made for this and colors selected that are quite a bit darker than the tooth structure. Whether this is also true of Schoenbeck's I am unable to state as I have never used it in the mouth.

Ascher's literature contains the following paragraph: "Ascher's artificial enamel is guaranteed not to shrink *in the mouth*. You cannot test it for any qualities out of the mouth. It was made expressly to meet conditions as they exist in the mouth and we do not care how it acts out of the mouth."

Since childhood's sunny hours I have always been unhappy when anyone told me I could not do certain things and that sentence, "you cannot test it for any qualities out of the mouth," roused the worst instincts in my nature. Had they told me tests out of the mouth were unreliable, it might have given me pause, but to say I *could* not was almost as bad as though they had told me I *must* not. I therefore prepared numbers of glass tubes about three-fourths of an inch long, sealing, or almost sealing, one end in the flame. I then, with the cooperation of Drs. Byram and Jackson, made several fillings with both Schoenbeck's and Ascher's cements, which, after setting twenty-four hours, were covered with red ink. In packing the cement in these tubes, the difficulty in leaving the mixture in actual contact with the bottom of the tube as the instrument was withdrawn, was noticeable. A great tendency existed for it to stick to the instrument and draw away from the tube bottom. In the first five tubes fillings were inserted of Schoenbeck's cement, the working points being vaselined in each case. After setting twenty-four hours the vaselin was dissolved out with chloroform and red ink put in the tubes. In every case the ink showed from a third to half way down the filling, the remainder of the filling being ink-tight. The reason was that in condensing the cement in the tube with vaselined instruments, the tube itself received a coating of vaselin. This re-

moved by the chloroform, the ink found its way into the resultant space. The lesson this would seem to teach is that working cement *within the cavity* with vaselin-coated instruments is bad practice, for the vaselin will at first adhere to and afterward be removed from cavity walls as from the tube walls. So that much had been learned. Next, fillings were made with Schoenbeck's cement, using no vaselin, but trusting to Providence and manipulation to release the working point from the cement mass. Each of these showed a narrow rim of leakage about the marginal edge, due to the cement slightly drawing away from the edge as it clung to the working point of the instrument. Every filling made of Ascher cement leaked from top to bottom. The ink did not penetrate the Schoenbeck mix and very slightly discolored the Ascher near the periphery. Under a low power glass a fractured Ascher filling has a most beautiful dense, crystalline structure, the crystals being much smaller than with the Schoenbeck.

So, in spite of Ascher's warning, we did test his material out of the mouth and got some results. Briefly summed up, they are:

1.—Do not use vaselin instruments when there is danger of getting vaselin on the cavity walls.

2.—Be careful you do not draw cement away from margins in withdrawing your instruments.

I did not attach any importance to the shrinkage of the Ascher product. The mouth condition they wanted met was mouth temperature and that we did not meet in the glass tube experiments. I next made two fillings of each cement in steel dies formerly used for testing amalgams. The dies were heated to 100 degrees F. and, as soon as the fillings were inserted and crudely dressed down, were put in an incubator and kept at a temperature of 100 degrees F. for twenty-four hours. At the end of that time, the two Ascher fillings fell out of their dies while I was removing them from the incubator to my office for microscopic inspection and the Schoenbeck fillings were so loose they could be pushed out without difficulty. That both of them had undoubtedly shrunk was apparent to the naked eye without the intervention of a lens. Beyond calling your attention to the fact, I believe I have no comment to make. If there was anything faulty in my experimental work, crude as it was, I do not know it. The question of

shrinkage, however, has always been a factor of uncertainty in silicate cements. If it has been overcome I believe we have in them the best plastic filling material ever offered the profession. If it has been overcome.—*Dental Era*.

CROWNS WITHOUT SOLDER, BRIDGES WITH AND WITHOUT SOLDER, AND A TALK ON CROWN AND BRIDGE WORK. By Albert W. Jarman, D.D.S., Philadelphia, Pa. The practice of dentistry undergoes many changes from time to time, as its history shows. Dentists acquire many hobbies, some of which last and become established methods of practice, while others fail when subjected to the test of durability. That the use of 24-k. gold inlays, as demonstrated by Dr. Taggart of Chicago, will become general cannot be doubted. These inlays fit the cavity closely, and having the durable and adaptable edge of pure gold carried out to the most minute feather-edge, leave no possibility of doubt as to the exactness of their manufacture and adaptation to the margin of the cavity.

The process of casting gold can be utilized in other ways and in other branches of dentistry. Its application in crown and bridge work is almost unlimited. The writer does not claim priority regarding its application to crown and bridge work, but believes that its introduction in this branch of prosthetic dentistry will tend to revolutionize all the old methods of making crowns and bridges, for the reason that while by the casting method they will be made as perfectly as heretofore, they will, however, be made after a more scientific method and of the same grade of gold throughout, thus lessening the need of solder. Crowns and bridges thus made restore the articulation perfectly, give any desired contour to the crowns, and leave a clean surface which can be finished with less pits and without any difference in color. A description of its application to this important branch of dentistry will perhaps be of interest to some readers, and in addition, by making investigation more general and by enlisting the experience of the many prosthetic practitioners, its use will, without doubt, become more generalized.

The Taggart apparatus and the Custer electric casting appliance will be found very convenient for this work, although good results can be obtained by many appliances which are on the market, in-

volving the casting principle. Dr. Taggart's apparatus requires nitrous oxid and gas for the source of heat and pressure; Dr. Custer uses the electric arc light for melting the metal, while by some casting methods the flame of an ordinary blowpipe is sufficient. The use of a casting appliance does away with all die plates, buttons, fusible metal cusps, and in fact with all cusp systems and swaging appliances now in use. Pure gold matrices to be filled with coin gold or 22-k. plate are no longer needed, since the pure gold was used only as a matrix and was polished off when finishing the cusp portion of the crown.

Of course this system will not appeal to those who desire to

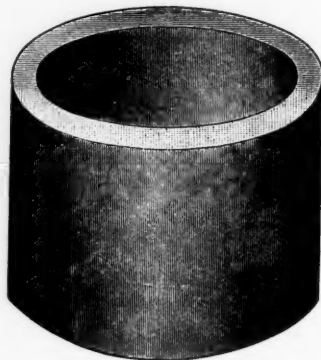
FIG. 1.



FIG. 2.



FIG. 3.



make bridges and crowns by a swaging method from gold disks or other forms which are filled with a small quantity of solder in the cusp portion of the crowns, using as little material as possible in order to obtain a large profit at a small fee. Inasmuch as by the casting system the piece is made more solid, stiff and durable—thus using more gold than ever before—it will certainly appeal only to those who are imbued with high ideals and a desire to produce a superior grade of crowns and bridges. We can make, by the method under discussion, crowns with cusps that will articu-

late perfectly, for they can be finished as thick as desired by first carving the crown in wax as it is to be after its casting in gold.

Any desired variety of gold can be used for casting; clasp metal can be employed when necessary. Many a crown-and-bridge worker is partial to coin gold—since it has a richness of color when properly polished, and owing to the copper it contains it gives great durability and stiffness to the finished piece. Other practitioners prefer 22-k. gold. As this system applies to any form of gold, that to be used will depend on the choice of the dentist. As coin gold, however, is best suited for removable bridge work, this paper will refer to it almost exclusively as the material *par excellence* for all crowns and bridges, fixed or removable.

It might be well at first to say a few words descriptive of the casting appliances and their parts, but to avoid detail I will intermingle the description as much as possible with the subject-matter of the article. We will deal first with a shell crown, either a molar or bicuspid. First in order is the fitting of the band to the prepared root.

MOLAR OR BICUSPID SHELL CROWN BY THE CASTING PROCESS.

As the subject of root preparation is a lengthy one and rather remote from our subject, I will avoid detail at this time. The root having been prepared in the manner recognized by bridge workers—all undercuts having been removed—a sweated band of coin gold should be adjusted so as to fit the root properly and to extend slightly beneath the gum margin. Having fitted the band to the root, shape the sides of the band to the general contour of the tooth. Restore as much of the contour, by shaping the sides of the band, as the fulness of the latter will permit. Further contour can be obtained prior to the casting by adding wax and carving it to the desired shape. We may now take an impression of the teeth with the band in position, a satisfactory method consisting in placing plaster on top of the band and adjoining teeth, and then directing the patient to close the mouth, thus obtaining an accurate impression of the adjoining teeth, the occluding teeth and an accurate bite. From this impression plaster casts are prepared, articulated to each other, or, if preferred, articulated by means of a crown articulator. The casts will give a correct representation of the band when in

the mouth. S. S. White base-plate paraffin and wax, or any form of paraffin wax which can be carved, is now softened sufficiently to make it moldable, and is pressed into the band in order to form the masticating surface of the crown. Should you prefer it the wax may be placed in the band while on the root, and the patient directed to close the mouth, after which the band may be removed with the wax in place, which will then be ready for carving. Any work that can be done outside of the mouth, namely, on the casts, is preferable to both patient and operator. If the work be done on articulated casts, the wax is placed in the band and the articulation closed, in order to secure an accurate impression of the occluding teeth in the wax. The fissures and cusps are carved in the wax, but care should be taken not to disturb the articulation.

The piece having been prepared after the manner above described, is now ready for the flasking. First, we introduce the sprue (Fig. 1) into the wax cusp, at some point where the crown may be easily finished (Fig. 2). Then remove the band and wax cusp from the cast, being careful not to disturb the relationship of the wax to the band. It is now invested in a fine investing material. (Dr. A. E. Peck's porcelain inlay investment compound being a useful one for this purpose.) Invest the case in the flask (Fig. 3); allow the investment to harden sufficiently, and remove the sprue by heating and withdrawing it from the investment. This leaves an open gate to the crown. Invert the flask containing the invested crown and place it over the slow fire of a small gas stove. The size of the flame is increased as the investment dries, and when heated to redness carry it to the casting device, and place a large nugget of gold, of the same kind as the band, in the carbon crucible, or, if the carbon crucible is not used, over the entrance to the gate of the flask containing the invested case. This nugget of gold is now heated until it is in the spluttering state—a state beyond melting. When this occurs turn on the air or nitrous oxid pressure, whichever be the one used. The Custer apparatus will require forty pounds air-pressure. The pressure will force the metal down into the flask and reproduce in metal the form as carved in wax, and the cast metal will be firmly united with the band. The cast crown is removed from the flask and treated with hydrofluoric acid, so as to dissolve any minute particles of the investment ma-

terial that might remain attached to the gold. The crown is now ready for diskings and polishing on the lathe.

BRIDGE WORK BY THE CASTING PROCESS.

Bridges are made in a manner similar to the method described for crowns. As the size of the sprue hole is necessarily small and cannot be increased, we are limited to the size of casting that may be made through a single sprue or gate. With the apparatus now on the market, it becomes necessary to make the castings for bridge work in sections which can easily be joined by the use of a high-karat solder. Small bridges can be cast in a single casting and without the facings, unless the detachable facing be used. In large cases the casting method must be limited to the making of the gold portion of the bridge in sections. It is indicated especially in cases where the saddle is used, and the lingual as well as the buccal surfaces of the bridge are to be of the proper contour. Self-cleansing bridges—bridges without porcelain facings and with open spaces—can easily be made by this system, but in the case of a long self-cleansing bridge it will be necessary to make it in two sections, and to join them with a high-karat solder.

Operative dentistry not having as yet reached the stage where all teeth can be saved, we are every day brought face to face with conditions which require the best prosthetic ability to restore lost teeth by substitutes which will fill the spaces in the upper or lower dentures, and by substitutes I mean those which will imitate the lost organs in form, size and functional usefulness. The ideal way to supply teeth in case of partial loss is by means of high-grade crown and bridge work; crowns that will articulate, and bridges that will be cleanly and resist the stress of mastication.

WANTED!—A MECHANICAL SENSE.

In the September issue of the DENTAL DIGEST is a paper by Dr. James Truman entitled "Wanted!—A Pathologic Sense." I might say, and I think many will agree with me, that a paper could also be written having for title "Wanted!—A Mechanical Sense," judging from the many bridges made which are mechanically wrong. In these cases the leverage is often such as to cause opposite results from those desired. How many bridges are made for the

front of the mouth, without previously considering the need of restoring missing bicuspid or molars!

The molars and bicuspid are the teeth adapted to withstand the force of mastication. The anterior teeth are for cutting purposes only. The articulation of the molars and the bicuspid, when normal, retains the teeth in position, and when abnormal, holds them out of position.

An excellent method of procedure for crown and bridge work is to study first the articulated casts. Take the articulated casts of the upper and lower jaws as a case presents itself, and study them with the same thoroughness as a practitioner of orthodontia would, but with a "prosthetic sense." First, consider the replacement of lost molars and bicuspid, so as to relieve the strain upon the anterior teeth, and when the restoration of the masticating surfaces in the back of the mouth is completed, it will be time to place bridges or crowns, if necessary, in the front of the mouth.

It is not necessary to take any plaster impression for the study casts, as a modeling compound impression will produce casts which will show the length of bite and general form of the teeth and mouth. If after a study of the articulated casts it is decided that crown and bridge work is necessary, it should be made of the highest grade possible, and, for hygienic reasons, the removable bridge work should be preferred; also because it can be more easily repaired in case of accident. The saddle can be used in most cases of removable bridge work, as it affords opportunity for the entire restoration of the lingual and buccal sides, leaving no hollow spaces or openwork beneath the bridge to annoy the tongue. The base of the saddles should be made of soft platinum reinforced with coin gold, in order to have a pure platinum surface next to the gum.

The saddle should be so adjusted as to be in perfect relation with the removable portion of the bridge to which it is joined, and should fit tightly to the gum. Its size must depend on the nature of the muscular attachment on the lingual and buccal sides. The higher the alveolar ridge, the more useful is the saddle. Its adjustment to the gum should be such that it will not bear upon the top of the ridge as much as upon either side.

The molar and bicuspid crowns with removable pins, as supplied by the dental supply houses, will be found very useful in saddle

work where a porcelain masticating surface as well as a buccal surface of porcelain is desired. They will be found very useful in lower bridges, as they minimize display of gold.

As the lower teeth are sometimes exposed to view during laughter, on account of the mouth being opened widely, any method that will give a porcelain masticating surface to lower bridges is worth consideration.—*Dental Cosmos*.

ETHICAL RELATIONS BETWEEN PROFESSIONAL MEN. By Thomas L. Gilmer, M.D., D.D.S., Chicago. Men who have chosen medicine as a career realize before their choice is made that medicine is a profession and not a business pursuit, and this idea remains with the best of them through their entire student and professional life. In addition to this opinion there is a belief by the prospective medical man that there is a necessary primary training needed as a foundation upon which to construct a medical education, which will fit him for the study. This belief is harbored, not only by the man who contemplates the study of medicine, but by the world at large, and does seem fit that one to become a professional man should be sufficiently versed in grammar, mathematics, history, physics, Latin, etc., to enable him to easily comprehend and apply what he has to learn to become a professional man. With these beliefs firmly fixed one can understand why young men studying medicine have, as a rule, rather exalted ideas of their chosen calling and why they are, in the main, ethically inclined. Ethics with them is so intimately associated with their calling that to be unethical would be thought vulgar and unworthy of one belonging to so old and honorable a calling. Medicine as a profession dates back hundreds of years and on account of its age and the esteem in which it has ever been held it is surrounded by a halo of glory. Most of the more influential and successful practitioners of medicine have been attracted to medicine primarily, not with the thought that here is a pursuit one can use as a means to gain much money with slight labor and little responsibility, but rather with the idea that it is a great and noble calling, which on this account appeals to them. That there are some unethical men in the practice of medicine is a painful truth, but when one looks back and remembers the physicians he has known he will discover that the great majority of them have

been fairly good men ethically, and that they generally have stood for the best in the community in which they resided.

Dentistry is now generally spoken of as a separate profession, an opinion I do not wholly concur in, as it seems to me difficult to separate it from the healing art. Since, however, it is taught in separate schools and has its own degree, we may perhaps speak of it as a separate profession. If it is a separate profession, it is a very young one, as compared with medicine, theology or law. About seventy years ago the first independent dental school conferring the degree D.D.S. was organized. It is within my memory when the majority of practitioners of dentistry were men never having had college training, professional or otherwise, all knowledge of the art having been acquired from preceptors whose training was in turn obtained from a similar source. Mechanical aptitude was then thought the qualification most essential for the practice of dentistry. It was in reality a handicraft, wherein book learning was supposed to be unnecessary to properly equip one for practice. Great progress has been made in dental education, principally in the last quarter of a century. No one now thinks of entering the profession except through the recognized channels, viz., the colleges.

When we study the history of medicine and compare it with dentistry we can easily comprehend why there is more professional spirit and greater exemplification of ethics in medicine than in dentistry. The laity is just beginning to realize that dentistry is something more than a rather high-grade trade, a little above the jeweler. This belief has not been entertained by the uneducated only, but was and is to a great extent the opinion held by the educated, including many of the best informed physicians and members of other professions. If today the medical man who has given the subject little thought, and there are many of these, is told what the curriculum of the dental school embraces, he is almost skeptical.

We have seen the mental attitude of the people regarding the requirements for medical study, and we have seen the view taken of dentistry in the past, and to a great extent at this time. Is it surprising that with this conception of dentistry the applicant to our schools should have a very different idea, or that he should not so universally become an ethical man after graduation as does the physician? One might assert without fear of serious contradiction

that but a small per cent of the applicants for dental training come to the schools with the thought that they are entering a learned profession, or that they have come to equip themselves to study vexed problems, many of which, even if they should live to the three score and ten years usually allotted man, they will not have time to solve. Do dental, as medical students, feel that they must take post-graduate work and spend years in foreign travel, visiting hospitals and schools of pathology before they are fully equipped for practice, or to fit themselves for greater study? Or do they eagerly seek hospital internships, which monopolize all their time for two or three years preceding their post-graduate study? It is true a few graduates remain in dental schools as demonstrators, but usually most of these remain only that they may become more efficient technicians, and to get a better insight into the mechanical side of dentistry, not, as a rule, to learn more of histology, more of pathology, etc. There are notable exceptions to this rule, but the exceptions are rare.

Many of the applicants to dental schools have chosen dentistry as a life work because they have the erroneous opinion that it is a calling giving large returns in money for a small outlay of talent, and that sufficient knowledge for its practice is not only easily acquired with indifferent primary education, but that the practice of dentistry is light and easy work. They rarely become dispossessed of these ideas until they have become practitioners, and I fear some never realize that they are members of a learned profession. To this conception of their calling may be attributed the lax ethical practice of some dentists. Great progress is being made for betterment in this direction. Still, much must yet be done to lift our profession to a higher plane, and this cannot be done unless we learn how professional men should deport themselves toward one another. No dentist can gain his own, his colleagues' or his patients' esteem by belittling the services of even his weakest brother. Dentists are too much given to criticising the work of other practitioners. We all do work which proves after a time to be miserably poor, work we are not proud of when we see it in after years. No man can do equally fine and perfect operations at all times, and under all circumstances. Some days we are not physically at our best; our nerves are out of order. Sometimes we have patients for whom no

one could do perfect operations. Remember this when you see failures from the hands of other operators, and be charitable. Instead of criticising other practitioners mentally, or to your patient, which is worse, remember the golden rule, since before you get through with your newly acquired patient you may find him so difficult to work for, or there may develop so many obstacles in the way of success, that you may be glad if he goes back to his old dentist.

Do not always believe what all new patients tell you of the other fellow. It may be that they will say just as mean things of you to some one else. I may here relate an experience I recently had with a brother practitioner. I had the care of a young fellow as a patient from the time he was a small boy. I never had a more difficult patient for whom to work; he was a terror, and his teeth just melted away. I never served a patient more faithfully. I was always completely exhausted after an hour with him, but I got him to his twenty-third year without the loss of a tooth. He had become to some extent immune to decay. Many of the fillings I had made for him were doing good service, but naturally were defective, but I was keeping close watch over him and only refilled his teeth as they showed absolute need for it. In my absence from the city he went in to see another dentist. Instead of rendering him temporary service and sending him back to me, he condemned much of the work I had done for the boy, said uncomplimentary things about me, said I was too busy, I had too much to do, and that I had neglected his teeth, etc. He persuaded the young man to have fifteen or twenty of the fillings removed, and replaced them with porcelain. The result was that the whole family thought I had neglected the patient, as this dentist told them, and their minds were poisoned against me. I have learned since that almost all of the porcelain fillings made by my censor have fallen out, and they now hate him worse than they hate me. When a patient comes to us from another dentist who is temporarily absent from his office we should give him temporary service only, and refer him back. We cannot do otherwise and be ethical.

Unless we know a man has been grossly careless or unless we know him to be a quack, never criticise unfavorably, even if the work is poor. We gain nothing by it, and we may do a worthy fellow practitioner a wrong. Patients are forgetful as to the time

when services are rendered. I have records of every filling I ever made, dating back to 1871. These records have won me pounds of candy, the wager being placed on the time when some particular service has been rendered, perhaps the last operation. The patient almost always underestimates the elapsed time. If he sets it at two years, most likely the record will say five, or sometimes longer. It is not an uncommon thing for a patient to say, "That filling you last made for me has come out." I reply, "Is that so? That is too bad." I look at the tooth indicated and feel sure that it was never filled, but that it is a new cavity. I look at the record and after a little explanation and exhibition of the record convince him that the cavity is a new one, probably an approximal cavity in which the dentin has been destroyed, leaving nothing but a thin wall of enamel above, which has suddenly broken down. The patient was honest in the belief that a filling had been dislodged. He had not only made the mistake regarding the loss of a filling, but probably may have underestimated the time since he was in for an examination. Had this patient gone elsewhere there would have been an opportunity for an unethical man to make capital out of it, but capital the increment from which would bring in poor returns. No one ever gains anything by pulling down someone else. He loses self-respect and lowers himself in the minds of those he hopes to gain as patients. Such practices never pay in any way.

Many times I have had people come to me requesting an opinion on the services recently rendered by someone else. I kindly but firmly decline to give it; it is undignified to do otherwise. Always protect a worthy brother practitioner, even if he has made a bad blunder. We all make mistakes; no one is infallible. I have many times saved a young practitioner great injury by saying a few kind words for him. A wise look, a shrug of the shoulders, is sometimes more damnable and contemptible even than outright saying mean things about a fellow practitioner.

To be strictly ethical is only to be a self-respecting, true man. Let us prove to the world that we are not mere mechanicians, but truly thoughtful, studious, ethical, professional men, and in time dentistry will take its place, where it belongs, by the side of the older professions. It lies with us to make it thus.—*Northwestern Dental Journal*.

RELATION OF BACTERIOLOGY TO THE PRACTICE OF DENTISTRY. By A. A. Stewart, L.D.S., Toronto, Canada. Bacteriology, when taken in its broadest sense, is a department of biology. Biology includes the study of all forms of life, or it has to do with the origin, development, structure, functions and distribution of animals and plants. We may eliminate all forms of animal life, the higher forms of plant life, and most of the forms of the lower orders, for it is in the lowest order of plants that we find those pathogenic forms of bacteria which are of interest to us. We owe our earliest knowledge of these pathogenic bacteria to Schwann, who, in 1838, published the first accurate study of the yeast fungus, showing that the fermentation was caused by the presence of the yeast fungus, and not wholly by chemical action, as it had been previously thought. He was vigorously opposed by chemists of the age, and by Liebig in particular, who held to the chemical theory of fermentation. Here the matter rested for a time until Pasteur took it up. He came to the same conclusions as Schwann. He entered into controversy concerning the matter with Liebig, and was able to substantiate his claims. These debates drew the attention of the scientific world, and in following these Mr. Lister, then of Glasgow, Scotland, conceived the idea that these microbic growths might be the cause of the so-called surgical fever. He argued that if they had the power to change the chemical qualities of fluids why might they not grow in the secretions of wounds in such a way as to prevent or hinder healing.

Mr. Lister began his experiments along that line in 1859. Antiseptics were known in those days, although they were used empirically. He set to work by excluding all organisms from wounds. He sterilized his hands and instruments, the skin of the patient and the air of the room. To his surprise and gratification the results were highly satisfactory. Wounds healed more rapidly, and practically without any pus formation. These results startled the medical world, and since that time the study of bacteriology has passed from the hands of laboratory men and chemists into the hands of the medical profession.

All microorganisms are not disease producing. They are

divided into two great classes, pathogenic and non-pathogenic. In the mouth we find many non-pathogenic bacteria. Why they are there we do not know. Apparently they produce no inflammatory processes of any kind. For all we know they may be beneficial.

There is another division of bacteria which is of interest to us, and that has reference to their location in growing. They are the parasites which grow in living animals, and the saprophytes which grow on dead animal tissue. Then there are two other classes, the facultative parasites and the facultative saprophytes. As their names implies, the facultative parasites are saprophytes by nature, which will grow as parasites, and facultative saprophytes are parasites, which will grow as saprophytes. It is to the strict parasites and facultative saprophytes that the pathogenic bacteria belong generally, although there are exceptions to this, but the exceptions can scarcely be called pathogenic bacteria.

They are also divided again in their ability to live with and without oxygen. Erobic are those which live with oxygen, an-erobic without, and facultative erobic with either. These last are by far the most numerous, and it is to this class that the greater number of the pathogenic organisms belong.

A moderately high temperature is necessary for the growth of microorganisms. Some are destroyed by low temperature, as the organism of yellow fever, but very many of them are not injured by freezing, and may be frozen up all winter, and will thaw out again in the spring, and will grow as if nothing had happened. Those organisms that are reproduced by spores are not injured by cold, even though the organism itself may be destroyed. Very high temperature will destroy the growing organism; 160 deg. C. will usually destroy all vegetation. Moisture is necessary for growth, and many cease to grow when dried, and that of typhoid fever is apparently destroyed by drying. Others may be dried up for years, and on moisture being again supplied will grow again. The vaccine virus is an example of this.

The physiologic processes of the microorganism are analogous

to those of the higher life, and we have the four distinct steps as follows:

1. The power of digestion.
2. The power of assimilation.
3. The power of formation of waste products and their excretion.
4. The power of reproduction in a definite line.

It is to the power of digestion and of the formation of waste products that we owe their power to produce disease. It is not the presence of the microorganisms in the body which causes the disease, but it is caused in some cases by the digestive ferments or enzymes which are thrown out, and in others by their waste products. There are four kinds of microbic poisons:

1. Enzymes, or digestive ferments.
2. Ptomaines or alkaloidal poisons, formed in dead animal matter. Leukomains or alkaloidal poisons, formed in living animal matter.
3. Toxins.
4. Toxalbumins, formed after the organism has died. They are albuminoid poisons.

If we take, as an example, a simple wound, we have, if there is no infection present, the usual processes of inflammation which tend to healing by first intention. If we infect this simple wound we find this difference. The bacteria will develop in the exudate, for it makes a splendid media, and these in their growth throw out their enzymes, which digest and dissolve the exudate, and destroy the leucocytes, and we have pus formation. Allowing this to go on the bacteria will continue reproducing, and their waste products, and after death their toxalbumins, will be absorbed by the patient, producing septicemia.

It is this state of affairs which it is necessary for us to guard against.

There is another phase of this subject to which pathologists of to-day are devoting a great deal of attention, and that is immunity from disease and susceptibility to disease. Such rapid strides have been made in the past few years that it may be but a short time until the practice of medicine may be revolutionized, and we will be practicing prophylactic dentistry.

There are different degrees of susceptibility and immunity. One may be exposed to a disease and not become infected, but under more favorable circumstances will contract the disease. This person is not very susceptible. Another will contract the disease under the slightest favorable circumstances, while others are entirely immune. Many animals are immune to the diseases of men, and it therefore limits the work in pathologic research to those animals which are susceptible. This latter is called natural immunity. A man has smallpox, and is afterwards immune. A child has measles, recovers, and is afterwards immune. The question is, why? The work of answering this question is largely the work of chemists associated with bacteriologists. Chemists have been examining the blood of susceptible and immune persons to find the conditions existing which bring about this immunity. They find two classes of substances in the blood which prevent this poisoning. They are called defensive proteids. This term was first applied, but has been divided into two groups, alexins and antitoxins. Alexins are antiseptic in their action. The amount determines the degree of susceptibility or immunity. Antitoxins are the direct antidotes of this particular bacterial poison. This is used in the treatment of diphtheria. These antitoxins are developed in the blood by reason of the contact with the particular poison which it antidotes.

Immunity from one disease does not immunize us from others.

If we take the conditions which are prevalent in the oral cavity and apply part of the foregoing, we may get the explanation of some of the facts which appear in everyday practice.

The mouth, as you all know, serves as a culture ground for the many varieties of bacteria found there. One would imagine that should the mucous membrane be broken and the tissues injured we would have a case of severe infection, owing to the number of bacteria present. But how often is that the case? Not very frequently. The bacteria present in the mouth are constantly there, and the patient has been continually absorbing their poisons, and consequently the alexins or antitoxins have been developed, which prevents any serious results.

On the other hand, if the wound is made by an instrument infected from the mouth of another patient, we have presented to

us a different aspect of affairs. The wound is infected by bacteria to which the patient is not immune, and we have an infection in the tissues which may become serious or not, depending on the nature of the infection, and the resistance of the patient. It is our duty then to render our instruments, hands, etc., as nearly as possible aseptic after treating each patient.

In going into the subject of sterilization and disinfection I will briefly describe the conditions and methods in laboratory work. Bacteria, as we know, are the most widely distributed of living things. They are found in the air, dust, water, etc., and as most of our laboratory work consists in obtaining pure cultures, we must begin by sterilizing everything and knowing that we have no infection at the start. Otherwise our work is in vain. Although the bacteria in the air are for the most part simple saprophytes, and not disease producers in the ordinary way, yet if allowed to mingle with our media we will have most profuse growths, and when we make our inoculations it will simply be a case of the seed falling among thorns.

Heat in some form is generally used, and of such temperature that the articles sterilized are not injured while the organisms themselves are killed. There is a great difference in the resisting power of bacteria, as we have already noted, and this has a large practical bearing upon the question of sterilization. A temperature which will destroy organisms ordinarily will not destroy those organisms which develop spores.

Heat is applied in two forms, dry and moist. A higher temperature is required by dry heat than by moist heat. The various pieces of apparatus used in bacteriologic work, such as flasks, test-tubes, Petri dishes and the like, are sterilized by heating to 160 deg. C. for three-quarters of an hour in a hot-air sterilizer.

The flasks are first plugged with cotton wool to prevent the passage of bacteria. The hot air sterilizer simply consists of a copper or sheet iron box with hollow walls and a fire-brick bottom, with a gas burner underneath. In the roof we have the thermometer. If the temperature is allowed to rise until it reaches 170 deg. C. all spores will be destroyed. For the various liquid

and solid media this is too high, and would evaporate and char the tube contents. Streaming steam in a steam sterilizer is therefore used. Although the spores of most bacteria resist the application of 100 deg. C. for a considerable time, yet the vegetative forms are destroyed at a relatively low temperature. Having this in mind, Tyndall suggested the discontinuous method of sterilization by streaming steam. The operation is carried out by use of a simple steam sterilizer. Steam is passed under a cover which contains the tubes of nutrient media. This is done for about thirty minutes and then is allowed to remain for twenty-four hours, when any spores present will germinate in the media, and are easily destroyed at a subsequent heating. This is done three times. Even this is not sufficient in all cases, as we find to our sorrow in the college laboratory, and it is necessary to obtain a higher temperature, which we get by use of an autoclave. This autoclave is similar to a large vulcanizer, with the safety valve set at about 115 deg. C. or 120 deg C., which gives us about 15 lbs. pressure.

Sterilization by filtration is sometimes adopted in the preparation of the soluble products of bacterial activity, such as toxins and enzymes. The material is placed in a specially constructed cylinder of unglazed porcelain. The canals of the porcelain are so minute and tortuous that the fluid alone can pass through, the bacteria being arrested. The filter must be sterilized frequently, which is done by heating to redness, using great caution, or by passing hot alkaline permanganate solution through it.

Coming down now to the question of sterilization in the office, it is one for which we can make no hard and fast rule. The personal equation enters into it largely. Different people have different results with different methods.

If we take first the skin, the steps are as follows:

1. Mechanical cleansing, use of brush and plenty of green soap.

2. Dip in solution of mercury bichlorid, 1-2000. As it has been shown that mercury bichlorid, even 1-1000 for 15 minutes, is sometimes defective this method is not reliable.

For major surgical operations gloves should be used and the

skin sterilized, preferably by the method first adopted in the Johns Hopkins hospital.

1. Scrubbing and washing with soap and water.
2. Application of solution of potassium permanganate.
3. Application of solution of oxalic acid.
4. Immersion in solution of mercury bichlorid.

When we come to sterilizing the oral cavity we have a very difficult proposition. Any germicide used in sufficient strength to affect bacteria would injure the mucous membrane very greatly.

After a long series of experiments Dr. Montefusco, of Madrid, has arrived at the conclusion that the best method of disinfecting the mouth consists in rinsing it and then brushing the teeth with a sterilized water and brush. According to his experiments aromatic essences have no effect on certain bacteria, such as the bacillus of typhoid and cholera.

I have found, however, that oil of peppermint 1 cc., alcohol 10 cc., and distilled water 100 cc., has a marked antiseptic action.

Another matter that I think receives too little attention by the laity is the condition of their tooth-brushes. I think it is the duty of every practitioner to instruct his patients in regard to it. As it is a universally recognized necessity that instruments should be sterilized, why not the tooth-brush? I have found from experimentation that brushes are infected after using nearly all the dentifrices on the market.

The reasons for sterilization of brushes are even greater than for sterilizing instruments, as the one can be at least thoroughly mechanically cleaned, while the brush can not. The usual mouth washes on the market are not sufficiently germicidal in their action to sterilize the brush. I may say that I am not able up to the present to give any good formula, as all that I have tried are either obnoxious when used or destroy the quality of the bristle. I use at the present time Wampole's formalin and a fairly stiff brush.

I scarcely think that it is necessary for me to say anything about the sterilization of instruments. That is a matter that has been so often and thoroughly dealt with that I can add nothing to it. I think there is no doubt that the simplest and most efficient method is boiling in water with a little sodium carbonate,

1 per cent. As the temper of cutting instruments is destroyed by repeated sterilization in this way, it is preferable to use this method, say, every morning, and then after each patient immerse in a 20 per cent solution of formalin for ten minutes. [5 per cent of sodium carbonate or borax should be added to the formaldehyd solution—Editor DENTAL DIGEST].

If there is an instrument more than another to which particular attention should be paid, it is the hypodermic syringe. One so often sees syringes being used which are full of bacteria around the packing, and around the joint of the needle. A hypodermic should be such that it can be boiled repeatedly. The packing, if any is used, should be asbestos, but the all-metal syringe is preferable.

Attention should be paid to the solutions which are injected. The solutions of cocain, which are so often used as local anesthetics, are particularly liable to be infected, as they are made up and allowed to stand for an indefinite period without very much care being taken as to whether they are sterile or not. It was thought that the trouble that so often followed the injection of an anesthetic solution was due to the decomposition of the alkaloid, but recent experimentation has proven that it is fairly stable, and previous trouble has been due to lack of aseptic precautions. The best method is to make up your solution as you need it. Use what you know to be sterilized water and take precautions that no bacteria reach it after it is made.

Mercury bichlorid combines more of the qualities of an ideal disinfectant than any other chemical. It is odorless, colorless, does not injure any fabric or material. Under most circumstances it is a reliable disinfectant, and it is inexpensive. On account of its corrosive action upon metals it cannot be used on instruments. Its power as a germicide has been greatly overestimated. Its reputation as a germicide is due in great part to Koch, who thought it almost infallible. Phenol is also a fairly good disinfectant. It is also a mild escharotic and deodorizer. A 5 per cent solution of it is a much less active germicide than 1-1000 HgCl_2 . To destroy anthrax spores it requires about five days, while HgCl_2 will do it in twenty-four hours. For ordinary pus producing bacteria an exposure of at least two or three hours

in a 5 per cent solution is necessary to insure their destruction. About its only use in surgical work is for the disinfection of cutting instruments.

Alcohol is regarded as an efficient germicide, and has been extensively used in the disinfection of the skin. It inhibits the action of ordinary bacteria, but is not destructive except upon prolonged contact. Its chief value in skin disinfection is removing the fat.

Potassium permanganate is an excellent germicide. It acts by oxidation of the organic matter, and can attack bacteria when other watery solutions fail. It is a powerful deodorizer. It leaves a deep brown stain, which is readily removed by the action of a saturated solution of oxalic acid. Its use is almost entirely in the disinfection of the skin. It is admirably adapted for this, as it oxidizes all the organic matter which cannot be reached by scrubbing.

Formaldehyd is one of the new disinfectants. It is a pungent gas obtained by the partial oxidation of wood alcohol. It is soluble in water. A 40 per cent solution is sold under the name of formalin. The gas is non-toxic, and is consequently suitable, as I have said before, for instrument sterilization, if borax be added to it to prevent action on plating; a 1-2000 solution for thirty-five minutes will disinfect instruments, but it seems to me better to use stronger solutions for a shorter time. For this disinfection of instruments in general boiling water leaves nothing to be desired, but the formalin disinfection may be used to advantage for the sterilization of those articles which are injured by boiling. It is especially urged that it should supersede alcohol for this purpose.—*Dominion Dental Journal*.

RECREATIONS FOR THE DENTIST, WITH SOME BASIC REQUIREMENTS. By Allan Gordon Bennett, D.D.S., Minneapolis, Minn. An article by Dr. B. Holly Smith has reminded me once more of a subject that has been not only too little discussed but too long neglected, with the inevitable result that too much ability has been crippled and not a few valuable lives sacrificed. Many of the points made by Dr. Smith are so much in evidence that it is surprising that the whole subject receives so little

attention. There is no doubt that the dentists are the hardest-worked men in the whole circle of the professions; that the conditions under which they operate are the most exacting and, generally speaking, the most exhausting; that the time devoted to operations at the chair is more monotonous and longer than that of any other specialist; that such is the nature of most dental operations for preserving the teeth that each must be performed in the best possible manner; and, finally, in the words of Dr. Smith, the dentist, unlike the general practitioner of medicine, is not always "made to feel that he and God are the great dispensers of healing and comfort."

It is true that there is more than one feature of dentistry that, aside from the fear and pain suffered by the patient, has not a little uplift on the operator himself. Dr. Smith says truly and aptly that "The evolution of graceful and natural forms under the manipulation of our fingers, and the restoration to normal type of marred and faulty conditions in the oral cavity, are more than interesting. The joy of recreation is a great and lasting joy, and it is in a measure a great source of stimulus and inspiration in the average day's work." But alas! the joy is too often sadly marred by the nervous condition of the patient, as our author intimates, and also by the inability of the operator to do himself full justice, by reason of this and his own depressed spirits and exhausted physical condition.

Besides all this and many other points too obvious to mention, a dentist's years of active life are generally too few for any to be wasted by depression of illness, or any and all kinds and degrees of disability. He owes it to himself, as well as to his patients, to order his life in such a way that, barring the slight changes caused by weather, climate or other environing factors, he will always be at his best, and in the end will meet the requirements of this exacting commercial age by finding the fullest compensation for all his endeavors; and since fatigue must come toward the end of crowded days, it is a most excellent plan—as Dr. Smith suggests and as I have always endeavored to carry out when possible—to arrange the long, difficult, delicate operations for the earlier part of the day.

Benefit from Daily or Weekly Outings.—What the dentist most needs, and needs all his life, is not an occasional vacation of even a month or two, but a constant vacation at the end of every week, if not at the end of every day, and, as I will show later, a positive

recreation every morning. According to my own experience it is more beneficial to take half or even a whole holiday each week than a whole season at one time. The two great evils of our civilization are too much of the artificial in place of the natural, and too much sedentary, indoor life, with too little active outdoor life.

I am much pleased with Dr. Smith's sentiment or suggestion as to making friends with the friendly forest, with many visits there and not a little basking under their leafy shade in summer; but I for one would not place the emphasis on even intelligent study, but rather on active rambling and unpremeditated enjoyment; for in this way one can best absorb some part of the forest's mysterious life, vigor and stimulating beauty.

I must take time and space to indorse strongly Dr. Smith's quotations from the versatile and poetic Van Dyke, as well as the beautiful stanza from Whittier. Not only we as a profession, but we as a people, are too much occupied with the material, the commercial and the prosaic, not only in the daily struggle, but in hours of leisure which should be devoted largely to living, thinking and enjoying all that makes for the beautiful and spiritual. It pleases me to think of the mind, not as a primitive dwelling with two or three rooms meanly furnished and merely for existing, but as an artistically constructed residence amply furnished with all that gives fullness and beauty to life.

But my purpose is to give basic principles and methods that can be used not only weekly but daily; not only in one or two seasons, but constantly throughout life. Too much cannot be said for outdoor sports with their pleasures that are so stimulating and invigorating; but they are not sufficiently accessible or convenient or even attractive to meet the daily or even weekly needs of the busy dentist. It cannot be too strongly emphasized that daily exhaustion demands almost daily renewal. Besides this every dentist, even more than other members of the healing fraternity, should embody or exemplify a good physical education, including not only such strength and skill as will be highly beneficial to himself, but he should exemplify such results in caring for the body as will most favorably impress others.

There is yet another argument that applies especially to the dentist. It is claimed that the most distinctive characteristic of the

American face is its narrowness. This, of course, means a narrow jaw and the resultant crowding of the teeth. I will make the claim that an equally distinctive American characteristic is narrow shoulders, and this, of course, means small lungs and weak breathing power, with the implied slow circulation and gradually accumulating waste products which cripple or wreck many a life before fifty, forty, or even thirty. In a word, I consider the expansion of narrow shoulders just as important as the expansion of narrow arches, and much more fundamental; and if I cannot demonstrate by my own experience the elevation of drooping shoulders and expansion of narrow ones—"made easy by the positive system"—if I cannot do this, I am free to admit that I have spent many pleasant years in physical training to little or no purpose. But, on the other hand, if a man at sixty-two is stronger and can stand much longer office hours and at the same time enjoys outdoor sport more keenly and indoor life among his books more intensely, there must be some reason or reasons beyond the mere flight of time or passive existence to account for such a desirable state of things. If I did not write from most satisfactory personal experience I should not write at all.

And, lastly, as to arguments, I will say that a dentist, or any other member of the healing art who persistently develops physical vigor, will find a most enjoyable and beneficial accession of mental activity, and such a degree of cheerfulness as will greatly redound to his own comfort and the happiness of others.

The Dentist's Need of Daily Physical Exercise.—To sum up briefly, then, we have found that of all specialists the busy dentist labors under the greatest daily strain, having the longest hours and generally the least compensation, and is, therefore, most in need of daily renewal by means that are accessible, economic, convenient, and as highly beneficial as possible. As to the actual value of physical training, the most vital point—and one not yet fully recognized—is that one's persistence and growth in vigor depend more on one's inherent or acquired interest and enjoyment of such things than on the theoretical or practical benefits one may have in mind or expect to realize at a later day.

It is an old saying as well as a fundamental truth that "Eternal vigilance is the price of liberty." It requires but a moment's reflection to be convinced that eternal vigilance is not only the price

of liberty, but the fixed or regular rate of everything that has real value in life as we know it, including not only the larger factors and genuine blessings of civilization in general, but knowledge, justice, reputation, character, health and life itself, in particular. Training, discipline and development have always been too partial and fragmentary; but now there is a movement, or at least a tendency not as yet too prominent, to begin at the beginning, and base all acquirements on a solid physical education. Such an education in its widest sense should begin with life and end at death. The highest ideal that can be realized; the broadest standard that is at once rational and practical, finds expression in the phrase "Fulness of Life," physical, mental, moral and religious. And in order that such fulness may be realized and enjoyed in any satisfying degree, its foundation in physical education must always be kept secure.

In regard to physical development, it may be said briefly that health, vigor and longevity depend not on stature or length of limb, but on the size and length of the body, and in particular on the breadth of the shoulders and depth of the chest, these dimensions implying the needed size and freedom of movement for the inclosed vital organs. Perhaps the most striking example of this style of physical architecture was the great Napoleon, who, though a very short man, had marvelous powers of application and endurance. A mere glance at his physique reveals at once the basis of these qualities—the large head, thick neck and the deep chest that usually belong to much larger men, and which are always the essential bases of all hard, persistent and long-continued exertion, mental, physical, or both. Personally and by achievements Napoleon was "the man without a model and without a shadow," but physically he furnishes a high standard for our purpose.

Nor can I forbear to mention the very modern up-to-date living—very living—example of physical vigor, mental activity, and personal and most diversified efficiency. It can be justly claimed that the whole civilized world admires Roosevelt's skill as a horseman, his success as a hunter, and, in particular, his love of sport, not to mention his honesty of purpose and his persistent endeavor to establish higher ideals and more just standards in politics and industrial affairs. But the main point for our present purpose is the

large returns this man is realizing from well-invested energy in physical development.

Now, in the matter of body building we must not only begin at the beginning, but must preserve a proper balance. Mere muscle building, except as a means to an end, is more liable to shorten life than to lengthen it, by weakening the very organs on which life depends. In the order of conscious life, next to the brain motor, the first essential is the normal flowing of the vital current, which is, of course, equally dependent on heart and lungs. But as regards energizing these two vital organs, they can be better contrasted than compared. All that the heart requires, generally speaking, is the normal supply of pure blood and freedom from pressure. Besides the vital nature of their action, which is but one step less automatic than the heart rhythm, the lungs are of all the vital organs the most amenable to improvement, both as to size and in particular as to strength. And the inactive, indoor life of civilization has so weakened these organs as to make their energizing the first essential. This might be termed a happy meeting of unfortunate conditions and of fortunate possibilities that are at once imperative and attainable. This increased size and strength of the lungs of course reacts powerfully on the circulation of the blood and the consequent renewal of all the tissues.

Physical Education and the "White Plague."—If, then, physical education is to be begun at the beginning—in the parts most weakened by disuse and most exposed to disease—the lungs demand the first and the most constant attention; and the very means taken to strengthen them tend to secure energy and balance in all the other vital functions—a statement that cannot be applied to mere muscle building. This should be obvious from the prevalence of the "white plague" throughout civilization; and when remedies of all kinds are so uncertain in combating this great scourge, prevention becomes the supreme need of the human family. And prevention means increased powers of resistance, which determine the line between health and illness.

But the lungs are expanded and invigorated not only directly for the benefit of their tissues and functions, but indirectly, or almost as directly, for the correction of the two most marked bodily irregularities—flat chests and drooping shoulders—besides giving the heart

more room and aiding in promoting the activity of the abdominal organs. Now, even though the lungs can be enlarged most easily and quickly in the region of the floating ribs, and expand most readily downward, it by no means follows that the upper portions cannot be both enlarged and especially strengthened. It should be noted that the upper or least expansible portions of the lungs are first attacked by disease, and therefore these should be first fortified. Not only in youth, but up to about forty years of age, and even later, the joints and cartilages of the ribs permit sufficient movement to allow of the two deformities just mentioned being readily corrected. It is even advanced, as a theory, that baldness is largely due to the retention of the residual air in the upper portion of the lungs.

Though most of these points are doubtless familiar to our profession, I think them of such vital importance that they will bear repetition for the benefit of the younger members, or for those who thus far have not felt the need of special attention to systematic care of the body. I do not claim anything original as to principle, though as to methods I think I can fairly claim that these I give you are at once the most accessible, economical and universal that could be named. Of course, there are others recommended by such experts as Von Boeckmann, but, aside from his apparatus, they cannot, without apparatus save the light weights recommended, be simpler, more positive, or more practical.

The Basis of All Gymnastics.—The expansion of the lungs, enlargement of the chest and elevation of the shoulders by the methods about to be described may be justly regarded as the basis of all gymnastics, because they not only give freedom and vigor to the circulation of both heart and lungs and flexibility to the whole spinal column, but develop and strengthen the main muscles of the chest, back, neck, shoulders, arms, hands, and even fingers.

The only apparatus required are iron dumb-bells, two or three pounds in weight and long enough in the grip to give force to the swing of the balls. In all expansion exercises the lungs should first be emptied as far as possible of all residual air—which is done most readily through the mouth—and then filled, with gradually increasing fulness, through the nose. First expelling the air enables one to hold the breath with least detriment—if there be any.

The first and most fundamental of these exercises may be de-

scribed as a lateral bending or tilting and twisting movement of the body, designed primarily for the stretching and enlarging of the body muscles, while the lungs are expanded to their utmost capacity. It can be readily seen that this is a most fundamental method of making room for the lungs. While the chest is enlarged to the limit of the joints and cartilages of the ribs, the movement of the layer of muscles under tension must result in enlarging the chest and raising the shoulders. The various steps are these: Take the dumb-bells by the ends or balls, exhale the air from the lungs, and then fill them to their fullest capacity and, while holding the breath, the arms are swung five to ten times alternately diagonally across the front from side to side, the body being tilted laterally and twisted around as far as possible at each movement. The first aim for some months should be to swing the dumb-bells as high as possible; then gradually increase the tilt and twist; finally, while making the swing shorter and more forceful, direct the attention mainly to raising and rolling the shoulders. At first this exercise may give one a smothering feeling, in particular those who have not been given to deep breathing; but that feeling soon passes, and after a few months or a year or two, one takes this exercise as "daily bread," and would not skip it any more than he would forego a "square" meal when hungry.

Of course if one has temporarily yielded to the climate or is "under the weather," it is well to skip a day or two, just as one when indisposed can most profitably decline to dine.

This method of bodily development as contra-distinguished from mere muscle enlargement without reference to the vital organs on which life and longevity and prolonged activity depend—this expansion of the chest and invigorating of the spinal column may be styled par excellence the one best adapted, not only to the dentist but to everyone of indoor life or sedentary habits, and is especially recommended as the middle period of life approaches, with its characteristic tendency to inertness or lethargy.

Chest, Shoulder and Arm Exercise.—Another good chest, shoulder and arm exercise consists in exhaling and filling the lungs and then, while holding the breath, and with the dumb-bells held by the grip, throwing them back and forth with a twisting or spiral movement of the arms. As will be seen, the longer the bells the more

positive the spiral motion. These two exercises can be used alternately.

These methods of daily getting and keeping in "good form" for the daily struggle are most beneficial and least exhausting when taken for from ten to fifteen minutes each morning. At first five minutes may be enough to get the best results, but of course the time will be gradually increased as one gains vigor and becomes more and more interested, and finds such life-increasing and life-prolonging exercises a source of genuine enjoyment. If persisted in for a year or two, one will find not only a gain in bodily strength, but such an increase in mental vigor that such exercises will be continued until they become a life-habit.

The Author's Method of Exercising.—But there is another form of exercise that I adopted years ago as an excellent preparation for the two just described. At the risk of chilling the interest of the reader and dampening his ardor, I can briefly describe this preliminary form of exercise as the vigorous rubbing that secures best results from a cold or cool bath, which I take every morning in warm weather and two or three times a week during the winter.

This rubbing, which should be done with a tough, corded towel held by the ends and "sawed" over the shoulders and around the body, is decidedly superior to a Whitely exerciser or any other apparatus that merely stretches arm muscles without other positive benefit. The idea is to make the rubbing and "sawing" regular gymnastic exercises. This is obviously developing and absorbing energy, and brings one as near the Eldorado once so ardently sought as one is likely to approach. Of course there are many that must modify the temperature of the water to suit their requirements. In either case, there is nothing passive about this form of exercise, as is the case in massage and Turkish baths; and personal activity is certainly the first condition in reaping the best results. I am bound to admit that it takes some force of will at first, as well as an abiding interest in one's program, but judging from experience, I know of nothing that so renews and equips one for the battle of the day as one-half to one hour spent on the three numbers of the program that I have drawn up. It may suggest a little more of the strenuous life than

all are yet quite willing to adopt, but I can say for myself that after years of experience I enjoy beginning the day in this manner almost as much as I enjoy closing it among my books, with an occasional evening in my basement shooting gallery, either alone or with a comrade.

I cannot speak as an expert in training for endurance, but it seems to me that these simple methods tend to develop and maintain the longwindedness so essential in many kinds of athletic sports or contests, and they are the basis of that perfect poise and steadiness so needful in marksmanship. In regard to this latter form of sport or recreation, I might modestly claim that I am entitled to speak with some confidence after about thirty years' experience with the rifle and eight with the pistol, on most of my weekly half-holidays from April to November, and though the majority may prefer other kinds of sports and recreations, I would strongly recommend shooting, for the reason that it is a good corrective for the continued use of the eyes at close range. And if one desires to strengthen the voice for speaking or singing, or both, I know of no exercises as a basis so well designed to accomplish that purpose. Again, if one must coin all his ideas and energies into a bank-account, he should daily reinforce himself with such simple and invigorating gymnastics.

Finally, it is the hope of the writer that he has not been taxing the reader's time and attention with arguments and illustrations devoted to a program that should always speak for itself. I will sum up by repeating that our civilization, which has substituted to such a large extent the artificial for the natural, and indoor for outdoor life, makes it imperative that one must be disciplined and equipped by such or similar lifelong habits as are here recommended; not so much to prolong our days as to maintain our powers at their highest vigor, and thus enable us to ward off the feebleness and disabilities of age as long as possible.—*Dental Cosmos*.

The Dental Digest.

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Where All Communications Should be Addressed.

Editorial.

THE FOURTEENTH VOLUME OF THE DENTAL DIGEST.

With this issue we begin the fourteenth volume of the DENTAL DIGEST with grateful feelings growing out of the treatment we have received from the profession. We have several good reasons for believing that this volume will be a great improvement over any other.

Under the new editorship of Dr. J. P. Buckley our readers can expect all of the articles which appear in the DENTAL DIGEST to be valuable and interesting. Dr. Buckley is a practicing dentist and is in a position to know the needs of the busy practitioner, and he will give his personal attention to the editorial direction of the journal.

The publication of society proceedings in full in the Original Contribution department has been discontinued, for the reason that in these proceedings there often appears much material of interest only to a few readers in certain localities. What society proceedings we do publish will be selected with the view of having a more general interest. In lieu of the publication of society proceedings, we have made arrangements with leading writers on dental subjects for articles which will be written exclusively for the DENTAL DIGEST, and these to be only of the highest order. Our readers will be pleased to know that, during the year, Dr. J. N. Crouse will write a series of articles on the manner of conducting a dental practice. These articles will be based on the author's long experience and will be of great value to young practitioners who are building a practice or trying to increase the character of the practice. They will appear either editorially or in the Original Contribution department.

The Digest department will be greatly improved. Such articles

will be selected from all of the journals, in addition to those in the Original Contribution department, as the editor deems will be of vital interest to all readers. Thus the DENTAL DIGEST will furnish everything of value to the busy dentist from the dental and medical journals of the world.

The Editorial department at all times, as in the past, will treat of live subjects pertaining to the profession in a fair and fearless manner. The DENTAL DIGEST is individual property, which places it in a position to discuss topics as we see fit.

In the News Summary department the special items are selected with a great deal of care, and this department has always been one of the attractive features of the journal. Many subscribers have written that this feature more than compensates for the price of the journal. We are now enlarging on this department and expect to make it still more interesting.

THE DENTAL PROFESSION BEREFT OF A FRIEND BY THE DEATH OF DR. NICHOLAS SENN.

By the death of Dr. Nicholas Senn the medical profession has lost one of its most noted surgeons and the dental profession a true friend. His death occurred at his home in Chicago, Thursday, January 2, 1908.

Dr. Senn was a great man. The skill of his fingers when engaged in surgical operations was equaled only by his great insight into the field of pathology and by his ingenuity in devising new methods and appliances to meet the demands of difficult cases.

Dr. Senn was a natural teacher, for it was easy for him to impart to others the great knowledge which he possessed. It has been said of him that he has written more textbooks than any other living man. His work on the surgical pathology of tumors, as well as many others, stands as a classic.

The last time that the writer heard him speak was at a banquet given by the alumni of a dental college when he spoke of the importance and emphasized the necessity of the profession delving more deeply into the field of oral pathology. He gave the dental profes-

sion full credit for the work it is doing and stood ready, at all times, to lend a helping hand. Truly he was our friend and his death will be sincerely mourned.—J. P. B.

IN MEMORIAM.

F. D. SHERWIN, D.D.S.

Dr. Sherwin was born in Roseville, Ill., November 26, 1864, and died at his home in Lincoln, Neb., October 18, 1907, at the age of 42 years.

When a child his parents moved to Traer, Iowa. At the age of 14 years he went with his parents to Edgar, Neb. On May 6, 1891, he was married to Miss Ida Searle. Dr. and Mrs. Sherwin remained in Edgar three years after marriage, when they came to Lincoln, April, 1894. Lincoln has been their home since. Dr. Sherwin began his professional career in Edgar, Neb., and continued it in Lincoln and with fine success. He was prominent in his profession in this city and state and his judgment was often sought by men his senior in years. He was a member of the Second Presbyterian Church of Lincoln, coming by certificate from the church at Edgar. He was a faithful and useful member. He was prominent in its councils, being an officer almost the entire time subsequent to uniting with the church.

He was a real convert to Foreign Missions. Two years ago Dr. and Mrs. Sherwin took upon themselves the support of a native pastor in Loas, Siam. Dr. Sherwin took great delight in him and his work.

He also took great interest in the local church, showing his great devotion by his words, work and money.

He was always interested in the civic affairs of the city; in good government; in the improvement of the city. His strict but sane views upon the keeping of the Lord's Day and the control of the liquor traffic were well known.

He was a man of high ideals; a valuable man in the community; conscientious in all his work and in his belief. The city and the dental profession will miss him.

Notices.

WAYNE COUNTY (N. Y.) DENTAL ASSOCIATION.

The Wayne County Dental Association was organized at Newark, Dec. 4, 1907, and the following officers elected: President, N. L. McDona'd, Newark; Secretary, F. E. Metcalf, Newark; Treasurer, E. E. Elliott, Lyons.

JEFFERSON COUNTY (N. Y.) DENTAL SOCIETY.

The thirteenth annual meeting of the Jefferson County Dental Society was held at Watertown, Dec. 9, 1907, and the following officers were elected: President, Clayton A. Sayers, Watertown; Vice-President, W. H. Wilson, Potsdam; Secretary-Treasurer, Charles S. Fowler, Watertown.

LYCOMING COUNTY (PENN.) DENTAL SOCIETY.

At the annual meeting of the Lycoming County Dental Society, held at Williamsport, Pa., Dec. 17, 1907, the following officers were elected: President, J. W. Jackson, Williamsport; Vice-President, B. L. Miller, Muncy; Secretary, B. B. Sprout, Williamsport; Treasurer, M. A. Cady, Williamsport.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Minnesota State Board of Dental Examiners will be held at the College of Dentistry of the University of Minnesota in Minneapolis on March 10, 11 and 12, 1908. All applications must be in the hands of the secretary by Feb. 25th.

For further information address the Secretary,

GEO. S. TODD, D.D.S., Lake City, Minn.

MARYLAND STATE DENTAL ASSOCIATION.

At the annual meeting of the Maryland State Dental Association, held at Baltimore, Dec. 21, 1907, the following officers were elected: President, G. E. Hardy, Baltimore; Vice-Presidents, J. W. Smith, Baltimore; T. O. Heatwole, Baltimore; Recording Secretary, W. W. Dunbracco, Baltimore; Corresponding Secretary, F. F. Drew, Baltimore; Treasurer, H. A. Wilson, Baltimore. Governors, W. G. Foster and G. L. Deichmann, Baltimore.

ODONTOTECHNIQUE SOCIETY OF NEW JERSEY.

The regular monthly meeting of the Odontotechnique Society of New Jersey will be held Thursday evening, Feb. 6, 1908, at the E's' Club, 37 Greene St., Newark. Dr. Ralph Waldron of Newark will read a paper entitled "Contracted arches; their causes, treatment and results."

At the March meeting, Thursday evening, March 5, a paper of extraordinary interest will be read by Dr. D. A. Webb of Scranton on the subject of "Malignant Growths of the Jaw; Fractures, etc." Stereopticon slides will be used to illustrate his essay.

JOHN A. VOORHEES, Correspondent,

Newark, N. J.

INSTITUTE OF DENTAL PEDAGOGICS.

The fifteenth annual meeting of the Institute of Dental Pedagogics was held at New Orleans, La., Dec. 31, 1907, and Jan. 1 and 2, 1908, and the following officers were elected: President, W. E. Willmott, Toronto; Vice-President, E. Hillyer, Brooklyn; Secretary-Treasurer, B. E. Lischer, St. Louis; Executive Board, J. Q. Byram, Indianapolis; D. M. Gallie, Chicago, and H. E. Friesell, Pittsburg. The next meeting will be held at St. Louis.

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

The St. Louis Society of Dental Science at the December meeting elected the following officers: President, Dr. George A. Bowman; Vice-President, Dr. Herman F. Cassel; Secretary, Dr. Clarence O. Simpson; Treasurer, Dr. W. E. Brown; Executive Committee: Drs. Richard Summa, E. P. Dameron, C. S. Dunham. Advisory Council: Drs. D. O. M. Le Cron, A. H. Fuller, Adam Flickinger, Burton Lee Thorpe, W. L. Whipple, Edward H. Angle, E. E. Haverstick.

CLARENCE O. SIMPSON, Secretary,
457 Century Building, St. Louis, Mo.

RESOLUTIONS ON THE DEATH OF DR. F. D. SHERWIN.

Whereas, the all-wise Providence has removed from this life Dr. F. D. Sherwin, who passed to the great beyond on Oct. 18, 1907, and

Whereas, the members of the Lincoln Odontographic Society feel a deep loss in the death of Dr. Sherwin because of the christian spirit he always exhibited as well as striving at all times to perfect himself for the better serving of mankind, and ready and willing at all times to lend a helping hand to those in need; therefore be it

Resolved, that in the death of Dr. Sherwin our society has lost a man of sterling worth, whose progress and efforts in his profession should be a source of pride to his co-workers, and from whose example all hope to profit; it is also

Resolved, that our deep sympathy is with the bereaved family, and that a copy of these resolutions be sent to his widow, to the dental journals, and be spread upon our society records.

LINCOLN ODONTOGRAPHIC SOCIETY,
H. A. SHANNON,
CLYDE DAVIS,

Committee.

CLINIC OF THE G. V. BLACK DENTAL CLUB OF ST. PAUL.

The Annual Clinic will be held in St. Paul on Thursday and Friday, Feb. 27 and 28, 1908, at the Old Capitol Building,

PROGRAM.

Thursday, February 27, 10 a. m.

1. Dr. A. C. Searl, Gold Filling.

2. Dr. F. S. James, Gold Filling.
3. Dr. J. W. S. Gallagher, " "
4. Dr. W. D. James, " "
5. Dr. K. E. Carlson, " "
6. Dr. W. R. Clack, " "
7. Dr. J. V. Conzett, " "
8. Dr. W. H. K. Moyer, " "
9. Dr. W. N. Murray, Cast Gold Inlay.
10. Dr. G. N. Beemer, " " "
11. Dr. J. O. Wells, " " "
12. Dr. F. S. Robinson, Ama'gam Filling.

TABLE CLINICS.

The list is not completed.

2 p. m.

Essay: "Western Dental Philosophy".....Dr. E. S. Barnes, Seattle, Wash.

Essay: "A Consideration of Western Dental Philosophy by an Eastern Man".....Dr. Charles McManus, Hartford, Conn.

8:15 p. m.

Illustrated Lecture: "Pathology of Dental Caries."

Friday, February 28, 1908.

9 a. m.

1. Dr. William Finn, Gold Filling.
2. Dr. W. C. Cranda'l, " "
3. Dr. F. J. Yerke, " "
4. Dr. A. M. Lewis, " "
5. Dr. F. S. James, " "
6. Dr. J. W. S. Gallagher, " "
7. Dr. J. F. Wallace, " "
8. Dr. C. H. Robinson, " "
9. Dr. A. C. Fawcett, " "
10. Dr. W. N. Murray, Cast Gold Inlay.
11. Dr. F. S. Richardson, " " "
12. Dr. C. E. Woodbury, " " "

2 p. m.

Essay: "Gold Inlays".....Dr. C. E. Woodbury, Council Bluffs, Ia.

Essay: "Certain Phases of Our Professional Duty".....

.....Dr. C. N. Johnson, Chicago, Ill.

All the gold operations, with the exception of those made by Dr. Moyer, will be made in proximal or proximoooclusal surfaces.

On Thursday Dr. Finn of Cedar Rapids, Iowa, will demonstrate cavity preparation, instrumentation, packing of gold, etc., using large wooden

teeth with cavities, clay, etc. This special demonstration will also be given on Friday.

Dr. W. H. Taggart of Chicago will assist Dr. W. N. Murray upon both days of the clinic.

A number of the manufacturers have written for space in which to display those things which are new.

Dr. J. B. Rideout of St. Paul will demonstrate upon both days of the clinic.

Everybody interested in the advance and progress of the dental profession is invited to meet with and take part in our meeting.

For further information apply to

R. B. WILSON, Secretary,
American National Bank Bldg., St. Paul, Minn.

LATEST DENTAL PATENTS.

- 872,091. Tooth brush holder, Fred J. Spangler, Lebanon, Pa.
- 872,626. P'ate for artificial teeth, James Humphrey, Boston, Mass.
- 872,908. Dental floss, John D. Cutter, New York, N. Y.
- 872,918. Making molds for dental inlays and the like. Wm. H. Taggart, Chicago, Ill.
- 873,015. Dental chair, Arthur W. Browne, Princes Bay, N. Y.
- 873,100. Dental broach, Carl A. Skalsstad, Chicago, Ill.
- 873,789. Artificial tooth crown and bridgework, James B. Righter, River Falls, Wis.
- 874,131. Making toothpicks, George P. Stanley and W. W. Tainter, Dixfield, Me.
- 874,189. Dental articulator, Wm. Hare, Galesburg, Ill.
- 874,199. Dental soldering apparatus, Jacob W. Horner, Columbus, Ind.
- 874,281. Dental plugger, Robert H. Antes, Geneseo, Ill.

News Summary.

JOSEPH FRAZIER, a dentist of Polo, Mo., died Dec. 14, 1907.

N. A. ROYER, a dentist of Evansville, Ind., died Dec. 26, 1907.

PETER KLIEST, a dentist of Manistee, Mich., died Dec. 11, 1907.

CHARLES A. COX, 41 years old, a dentist of Mobile, Ala., died Dec. 18, 1907.

EDWIN GALBRAITH, 30 years old, a dentist of Paterson, N. J., died Dec. 8, 1907.

HAROLD C. GUERIN, 37 years old, a dentist of Kansas City, Mo., died Dec. 9, 1907.

ED. M. CUNDALL, 44 years old, a dentist of Washington, Pa., died suddenly Dec. 9, 1907.

LAFAYETTE BUCKNER, for many years a dentist of Shelbyville, Tenn., died Nov. 16, 1907.

THOMAS D. SIMONTON, 76 years old, a pioneer dentist of St. Paul, Minn., died Dec. 14, 1907.

WATSON W. MONROE, 59 years old, a well-known Parkersburg, O., dentist, died Dec. 10, 1907.

ROBERT S. WEST, a dentist of New Orleans, La., died from a complication of diseases, Dec. 20, 1907.

F. W. YARBRO, 62 years old, a veteran dentist of Logansport, Ind., died from dropsy, Dec. 5, 1907.

R. W. SHARP, 61 years old, for many years a practicing dentist of Mason City, Ill., died Dec. 6, 1907.

JAMES F. P. DILLANE, 24 years old, a dentist of Toronto, Ont., died from typhoid fever, Dec. 17, 1907.

LEONARD TRACY HANKS, 63 years old, prominent in Iowa dental circles, died at Dubuque, Jan. 3, 1908.

M. H. LAMOREE, for fifteen years a dentist of Grand Rapids, Mich., died at Otsego, N. Y., Nov. 12, 1907.

EDWARD P. GEORGE, 67 years old, a prominent dentist of Thomaston, Me., died from blood poisoning, Dec. 19, 1907.

ALBERT B. NEWMAN, 29 years old, a dentist of San Antonio, Tex., died from pulmonary troubles, Dec. 30, 1907.

F. H. KENDRICK, 49 years old, for twenty years a dentist of Worcester, Mass., died from pneumonia, Jan. 1, 1908.

EHRLICH PARMLY, 78 years old, a retired New York dentist, died from paralysis, at Oceanic, N. J., Dec. 19, 1907.

CHARLES R. FOWLER, 63 years old, a retired physician and dentist of Columbus, O., died from apoplexy, Dec. 4, 1907.

JOHN T. CODMAN, 81 years old, the oldest graduate of the Harvard dental school, died at Revere, Mass., Dec. 14, 1907.

FREDERICK W. BURGESS, 86 years old, a widely known dentist of Long Island, N. Y., died at Huntington, Dec. 27, 1907.

JAMES S. KNAPP, 84 years old, one of the foremost dental practitioners and teachers of the past, died at New Orleans, La., Dec. 26, 1907.

W. CARLOS HAYES, 56 years old, for many years one of Buffalo's well-known dental practitioners, died after a long illness, Dec. 26, 1907.

ELIZABETH DAVIS McDONALD, 40 years old, one of the first women to practice dentistry in Philadelphia, died from tuberculosis, Dec. 21, 1907.

DAVID MARSHALL, 24 years old, a dentist of Florence, Ky., who was bitten by a rabid dog December 3, died at the Presbyterian hospital, Chicago, Dec. 23, 1907.

JOSEPH W. JAY, 82 years old, dean of the Indiana Dental College and one of the founders of the Indiana Dental Association, died at Richmond, Ind., Dec. 9, 1907.

CLARENCE EUGENE STROUD, 61 years old, a dentist of Sandusky, O., injured by the explosion of a vulcanizer, December 13, portions of which were driven into his forehead, fracturing the skull, died Jan. 2, 1908.

A PESSIMIST.—An ultra pessimist is one who concedes that every cloud has a silver lining, but who cites the fact that silver isn't worth anything like what it used to be.—W. D. NESBIT.

TO PREVENT CEMENT SLAB FROM SLIPPING.—A bit of rubberdam on which to rest the mixing slab is the best kind of an assistant to prevent it from slipping.—JOHN W. KEYES, D. D. S., *Washington, D. C.*

A LITTLE KNOWLEDGE IS A DANGEROUS THING.—A patient was overheard to say to one of the demonstrators in a college infirmary, "Doctor! I would like to have my teeth extracted painlessly, but my heart won't stand the cathartic."

IMPORTANT FACTORS IN USING PORCELAIN.—The success of a porcelain filling is dependent more upon a correct occlusion and the care exercised in fusing than upon any other factors in its construction.—DR. F. T. VAN WOERT, *Dental Cosmos*.

HOW TO PREVENT PAIN AFTER EXTRACTION.—An application of equal parts of guaiacol and glycerin applied into the socket of an abscessed tooth after extraction will relieve the most stubborn case within two to five minutes. Try it, and be convinced.—J. A. SHAW, *Dental Summary*.

DENTIST IN NEED OF FORGIVENESS.—Little 5-year-old Edith was taken to a dentist who removed an aching tooth. That evening at prayers her mother was surprised to hear her say: "Forgive us our debts as we forgive our dentists."

HOW TO REPAIR A MAXFIELD DISK MANDREL.—When the pins are broken off take a small bur and drill through the collar, close to the pin; next, take a nerve broach, the small end to the hole, and place the mandrel in a vise, then take a pair of pliers, hold the broach and drive it in tight; finally, end off the broach and shape to point and the mandrel will be as good as new.—DENTIST, *Holyoke, Mass.*

FALSE TEETH CAUSE CANCER.—George S. Morrison, a farmer living a short distance east of Mason, has returned from St. Louis, where he went about two weeks ago to be treated for cancer. Two growths, one inside and the other outside of his left cheek, were successfully removed. He attributes the beginning of the cancers to the irritations caused by a badly fitting plate of false teeth.

SEPTIC ROOT CANALS.—The advantages of the use of sodium dioxide in the treatment of septic root canals are, perhaps, not well understood. If a little of the yellow powder is carried into a root canal and a small drop of water introduced, the oxygen that is evolved acts as a germicide and mechanical cleanser, while the caustic soda enters the dentinal tubules for some depth, and thoroughly cleanses them of septic contents. It also combines with any fatty residues of pulp tissue that may be present and forms

soap, which is quickly removed with a wisp of cotton. After one or two applications the dentin is beautifully cleansed and bleached, and the tubules ready to absorb a dressing.—R. H. HEATH, *British Dent Jour.*

ACCIDENTS.—Dr. D. Reese of Mt. Vernon, Mo., while operating recently was struck in the eye by a splinter from the patient's tooth and loss of sight followed.—Dec. 17, Dr. H. D. Aldrich of Philadelphia, after several unsuccessful attempts to extract a tooth for a negro woman, finally mustered all his strength, the tooth came out and a point of the forceps struck his left wrist, severing an artery.

USE HYDROGEN DIOXID CAUTIOUSLY.—Many cases of necrosed bone have resulted from injections of hydrogen dioxid into blind abscess pockets. In case of sinus, it is not always possible, when it is injected through the root canal, to get it to pass out freely through the external orifice. The sooner its use is stopped, especially in the lower jaw, the less caries and necrosis will there be to deal with.—C. H. OAKMAN, *Dental Register.*

THE ANESTHETIST SHOULD INSPIRE CONFIDENCE.—I have come to believe the success one attains in administering anesthetics depends largely on the anesthetist; his personality, his manner, the impression he makes upon the patient is nine-tenths of the battle. It is often more potent than the anesthetic itself. Get your patients in a tranquil frame of mind, dispel fear, suggest the things you want them to see or feel so strongly that they will see or feel them.—W. H. DEFORD, *Dental Brief.*

BUT NOT WITH PURE GOLD.—A traveler in Ireland recently saw upon an old tombstone over there this epitaph:

DR. HENRY JONES.
Reader, behold with gravity,
For here lies Dentist Jones,
Filling his last cavity.

THAT TOBACCO ODOR.—To remove the odor of tobacco from the hands, wash in a thin cream of plaster of Paris—a teaspoonful in the palm with enough water to thoroughly wet the hands. Rinse well and then use soap and water as usual.

A half-teaspoonful in a mouthful of water well churned about by the tongue will also remove all odor and taste from the mouth. Rinse well and brush teeth afterward. This method is so effective it seems strange not to have been observed long ago.—C. D. CHENEY, *Hoboken, N. J.*

FATALITIES.—A man in Aspen, Colo., died Dec. 21 from erysipelas contracted after the extraction of an ulcerated tooth.—A man of Detroit, Mich., died Jan. 4 from the effects of blood-poisoning resulting from having a tooth pulled.—A woman of Bennington, Neb., died in the office of a dentist at Omaha, Dec. 21. She had taken chloroform and two teeth had been extracted when an acute spasm of the heart came upon her, causing her death.—A man of Youngstown, O., died in a dentist's office in that city, Dec. 19. Chloroform had been administered by a physician and the seventh tooth was about to be drawn when he expired.—A woman in Philadelphia

dropped dead in her husband's arms, Jan. 2, on her way to a dentist's office to gain relief from a toothache from which she had been suffering intense pain for a week and for which nothing that the dentist could do had afforded any relief.

IODIN FOR PHENOL POISONING.—Maberly reports the successful administration of tincture of iodine internally as an antidote where phenol had been swallowed. In the case of an adult, a small teaspoonful of the tincture in a teaspoonful of water was drunk slowly. In two young children five drops of the tincture in a teaspoonful of water were given and repeated at four-hour intervals. Relief to dysphagia and dyspnea was prompt and a speedy cure followed. Conclusion, iodine and phenol in equal quantities neutralize each other.—*Journal American Medical Association*.

FIRES.—Dr. Leavell, Woodville, Miss., Dec. 16; loss, \$500.—Dr. O. W. Copersmith, Stanberry, Mo., Dec. 22; loss, \$5,000.—Dr. A. C. Hayes, Wilkesbarre, Pa., Dec. 22; loss, \$2,000.—Dr. C. C. Cawthon, Emory, Tex., Jan. 1; loss, instruments.—Dr. W. S. Van Nostrand, Merrill, Wis., Dec. 28; loss, \$500.—Drs. C. L. Barten, Madison, N. C.; B. T. Stevens, St. Paul, Minn., and the James T. Ingersoll Dental Supply house of St. Paul were also losers by fires in December.—Dr. Z. F. Knapp, Naples, N. Y., Dec. 10; explosion of vulcanizer set fire to the office, destroying considerable property.

LOCAL ANESTHETIC.—During the past year I have obtained the most satisfactory results by using the following formula:

R	Cocainæ hydrochloridi	gr. iv.
	Morphinæ sulphatis	gr. i
	Phenolis	m. ii
	Aquæ menthæ piperitæ	q. s f ʒi

M. Sig. Use as a local anesthetic.

—W. A. LOVETT, *Items of Interest*.

SUBSTITUTE FOR IODOFORM.—If a dentist wants to use an agent that will have the same effect as iodoform, I would suggest that he employ euclophen, which is a substitute for it, and from which you can get iodine, which does the work. The only reason why iodoform is used is because when it comes in contact with the moisture in the tissue, it gives off iodine, and iodine is one of the best disinfectants we have; and if you want to use an iodine compound at all, instead of using iodoform, employ euclophen, with which you can get the same results without the odor.—Dr. J. P. BUCKLEY, *Dental Review*.

ROBBERIES.—A sneak thief entered the office of Dr. F. T. Bell, Aurora, Ill., during the noon hour, Dec. 28, and relieved him of gold crowns and bridges to the amount of \$15.—The offices of Drs. Hull & Schofield, Kankakee, Ill., were entered similarly Nov. 15, and gold valued at \$35 taken.—Drs. Tancie Smith and Wasser & Wasser of Laporte, Ind., were victimized to the amount of \$50 and \$400, respectively, Dec. 20.—Drs. Williams, Lafayette, Ind., lost gold and plate material amounting to between \$200 and \$300, Dec. 10.—Dr. Elmer C. Hanson, Racine, Wis., lost gold amounting to \$25, Nov.

19, and Dr. Homer L. Cheever, Kenosha, Wis., a similar amount, Dec. 6.—The office of Dr. A. D. Laughenour, Dallas, Tex., was burglarized Jan. 1 and a lot of gold and instruments taken.—Dr. Kimball S. Morgan, St. Paul, was beaten and robbed of \$100, Dec. 25, by a man who hid in his office and assaulted him when he entered. He is suffering from a severe bruise on the head.

JAP TOOTH-PULLING.—The Japanese does not frighten his patient with an array of steel instruments. All his operations in tooth drawing are performed by the forefinger and thumb of one hand. The skill necessary to do this is acquired only after long practice, but when once it is obtained the operator is able to extract half a dozen teeth in about thirty seconds, without once removing his fingers from the patient's mouth. The dentist's education commences with the pulling of pegs which have been pressed into soft wood; it ends with the drawing of hard pegs, which have been driven into an oak plank with a mallet.

PREPARATORY WORK IN ARTIFICIAL DENTURES.—I have found it a valuable help in mounting plain teeth, when they are in position on the cast before the final waxing up is given, to place plaster of Paris on the labial, buccal, and masticating surfaces of the teeth, and with the point of a knife or spatula press it between them, care being used to keep it away from the necks. It serves the threefold purpose of preventing teeth changing position when the final waxing up is given, it keeps the rubber from between the teeth, and prevents them from loosening in the flask when the wax is removed and the case packed.—J. F. KNAPP, *Dental Cosmos*.

TO REBAKE AN INLAY.—If for any reason you desire to rebake a porcelain inlay, after you have removed the platinum matrix, make an investment of powdered soapstone and thin shellac varnish, and while the investment is fresh embed the inlay, cavity side down, until flush with the margins. Dry slowly, and then fuse it again as high as you like without changing the margins or shape of the inlay. This would probably not do for low-fusing porcelain, because the shellac would not all burn out and a discoloration would develop. The soapstone powder may be made by scraping a fresh mechanic's crayon.—J. M. EVEY, *Tri-State Dental Record*.

SETTLE DR. EVANS' WILL; MUSEUM WORTH MILLION TO BE HIS MONUMENT.—After litigation extending over more than ten years, the affairs of the estate of Dr. Thomas W. Evans, the famous Philadelphia dentist who died in Paris, where he became a millionaire, have been adjusted in the courts of Philadelphia, New York and Paris. As a result, the "Dr. Thomas W. Evans Museum and Institute Society" will come immediately into the possession of property in New York worth more than \$1,000,000, and property in Philadelphia valued at \$100,000. The residue of the estate in Paris, worth at its present valuation about \$800,000, will be distributed among the heirs. At the time of Dr. Evans' death the estimated value of the estate was \$4,000,000 to \$6,000,000. The contemplated magnificence

of the two monuments Dr. Evans aimed to leave to perpetuate his memory, a monument proper and a museum, will fall far short of his intentions when he designed his will so as to leave his great fortune to the city of his nativity.—*Chicago Journal*.

ABRASIVE TOOTH POWDERS.—Dr. Joseph Head of Philadelphia has made some experiments as to the effect of brushing the teeth with gritty powder and stiff bristles. He placed the tooth in the mandrel of the lathe and applied a stiff brush covered with pumice stone, revolving many hundred times a minute, hundreds of times more rapidly than the brush would be applied to the teeth by the hand brushing, and this operation was continued for hours and hours. The result of his investigation proved that it would take a thousand or two thousand years to wear off the enamel of the tooth by any brushing process that we could adopt.—Dr. J. P. Root, *Western Dental Journal*.

TREATMENT OF THE GUM WITH CHLORO-PERCHA BEFORE SETTING A CROWN.—When the gum has been wounded in grinding the root or in reducing the band to the root level, the acid of the cement works into the wound and gives rise to discomfort similar to that following the application of salt or vinegar. This of course subsides as the cement sets, but is anything but pleasant while it lasts. To overcome the pain thus inadvertently induced, and to prevent such as may attend the setting of the crown, I dry the root and adjoining gum and paint them with chloro-percha. The effect is immediate, and the discomfort hardly worthy of mention.—I. C. EDINGTON, *Dental Office and Laboratory*.

THE RIGHT LIGHT IN THE OPERATING ROOM.—The wall tints of the operating room have an ocular value, and should vary according to the kind and amount of the general illumination. If a north or west light be generally used, dull cream, light buff, or light green paper, paint, calcimine, or burlap may be used with benefit. If the light be from the east or south, still darker tints are unobjectionable. In other words, while always using soft, unglazed colors, these may be made to vary with the intensity of the light admitted to the operating room—the brighter the illumination, the darker the wall tints. Let us repeat: Glazed paper or other objects that strongly reflect light into the eyes of the operator should be banished from the dentist's operating room.—*Dental Review*.

FAT THERAPEUSIS IN DENTAL CARIES.—If we imbed one half of a tooth in a batter of plaster of Paris and brush the exposed other half vigorously with oil for a few minutes, remove it and place it in a weak acid solution, we will notice that the surface impregnated with oil offers a much higher resistance toward the acid action. If we apply the same principle upon teeth in the mouth, we should expect results which are closely allied to the former. Kleinsorgen has adopted this principle of fat therapeusis in his own practice, and from close observation he is forced to conclude that this method of impregnating the teeth with some labile fat or oil at stated intervals produces an increased mechanical resistance toward carious destruction. The manipulative process is very simple. The teeth

are thoroughly cleansed and polished in the usual manner; they are dried and each individual tooth is now impregnated with white vaselin, employing an ordinary tooth polishing brush, rapidly rotated in the dental engine. To make the vaselin more palatable it may be scented with peppermint oil, menthol, or some other favorite essential oil. This oil or fat polishing process should be repeated by the patient himself at stated intervals, using the ordinary toothbrush and the vaselin as referred to above. Tests of this method are now carried on by a number of prominent practitioners in Germany, and probably in the very near future we will hear some further reports on this most interesting subject.—EDITORIAL, *Dental Era*.

AMALGAM VALUABLE.—Amalgam has been the greatest friend the dental profession has ever known, the greatest godsend to the public and, I am sorry to say, the most abused of any substance given us with which to preserve human teeth. With it one does not have to more than half try in order to get a result that will last at least long enough to free one from censure for lack of skill. When properly inserted there is no question about the ability of amalgam to save and make comfortable any tooth, and while the chief objection to its use is its appearance, yet this has become true of gold. The use of amalgam will probably last for many years, if not for all time, and its employment cannot be superseded entirely by the cemented filling—at the present status at least.—F. T. VAN WOERT, *Dental Cosmos*.

ILLEGAL PRACTITIONERS.—A dentist of Los Angeles, Cal., arrested Nov. 8 for practicing dentistry without a license, pleaded guilty to the charge, Dec. 12, but because of extenuating circumstances escaped either fine or imprisonment. Upon the statement of his attorney that he expected to take the examination as soon as possible and in the meantime would not practice his profession, he was let off with a fifty-day suspended sentence.—A dentist of Gloucester, Mass., was arrested Dec. 5, charged with practicing without a license; the case was continued, bail being fixed at \$300, which was furnished.—The case of a dentist of Utica, N. Y., charged with illegally practicing dentistry, adjourned from Sept. 24, came to trial Dec. 6, the defendant being fined \$50.—A dentist of Columbus, O., charged with practicing without a license was fined \$50, Dec. 16.

EXAMINING BOARD AFFAIRS.—At the December meeting of the California Board forty-four out of sixty-three candidates were successful in passing the examination. The officers elected are: President, A. B. Mayhew, Sacramento; Secretary, C. A. Herrick, San Francisco; Treasurer, J. L. Pease, Oakland.—The Oklahoma Board met in Muskogee, Jan. 2. More than 250 applicants to practice in Oklahoma were received. The board has ruled that in cases where a dentist came to Indian Territory after the passage of the enabling act, June 16, 1905, it will be necessary to take an examination.—Serious charges have been filed against the Washington State Board by Dr. E. J. Brown of Seattle. The complainant asks Gov. Mead, if the charges are proved to be true, to dismiss the board from public service. The complaint

is a lengthy one and is couched in strong language, charging the board with being everything from a trust to an un-American institution.—According to a new rule adopted by the Royal College of Dental Surgery of Ontario, no company nor corporation shall hire or employ a dentist who is not a member of the college. The rule is operative through the control of the college over its own members, who are forbidden to work in the employ of anyone who is not a member of the college.

BLACK'S INSTRUMENT FOR MEASURING MERCURY.—The weighing of mercury has always been a slow and tedious process, and to overcome that trouble this instrument was devised by Dr. G. V. Black. It is designed to measure bulk to obtain a definite weight of mercury. It consists of a cup into which a plunger is accurately fitted. The cup is dipped into the mercury and filled, and the excess is expressed when the plunger is closed. This plunger is adjustable and can be regulated to any weight necessary. After setting the plunger to the desired place a jam nut holds it firmly. Your committee believes that every dentist should know accurately the amount of mercury he is using in mixing amalgam fillings, and on account of the convenience of this instrument we do not hesitate to recommend it.—F. W. GETHRO, D.D.S., *Dental Review*.

ADJUSTING RUBBER DAM WITHOUT CLAMPS.—In cases where the clamp is objectionable for the retention of the rubber dam, and where the ordinary floss is not sufficiently bulky to prevent the rubber from drawing over it, a most admirable method of using the ligature is to first pass the floss through two pieces of rubber tubing, one piece for the buccal and one for the lingual side of the tooth. This is much to be preferred to stringing beads on the ligature, or using other means of holding the rubber dam. The tubing should be the smallest size sold at the rubber stores, the kind used for slipping over the bows of spectacles where they rest on the ears. To insure against leakage, drop a little sandarac varnish between the tubing and the enamel on the buccal and lingual sides.—E. M. S. FERNANDEZ, *Dental Review*.

MARRIAGES.—John C. Burnam, a dentist of Huntsville, Ala., was married to Miss Louise McAnally, also of Huntsville, Dec. 26.—Fred Wilkins, a dental student of San Francisco, Cal., was married to Miss Annie Simons of College City, Dec. 21.—Royal B. Giffin, a dentist of Sacramento, Cal., was married to Miss Gladys B. Hale of the same place Dec. 25.—M. H. English, a dentist of Wray, Colo., was married to Miss Agnes Stiles of Denver, Dec. 25.—George R. Lindsay, a dentist of Palisade, Colo., was married to Miss Hattie Tilley of Frederickton, N. B., in November.—C. L. Glenn, a dentist of Marissa, Ill., was married to Miss Anna Wagner of Evansville, Dec. 31.—Joseph Tormey, a dentist of Mt. Carmel, Ill., was married to Miss Nancy Connley of Covington, Ky., Oct. 29.—Hugh C. Hurd, a dentist of Chicago, was married to Miss Caro'ine C. Schaaf, also of Chicago, Nov. 28.—Charles Eaton, a dentist of Tremont, Ill., was married to Miss Emma Broadhead of the same place, Jan. 1.—John F. Clark, a dentist of Springfield, Mass., was married to Miss Minnie C. Sullivan of North

Adams, Nov. 28.—William E. Greenwood, a dentist of Detroit, was married to Miss Edna Hisey of Saginaw, Dec. 11.—C. W. Coffman, a dentist of Lewisburg, O., was married to Miss Mary F. Lewis of Lancaster, Dec. 8.—J. M. Tobin, a dentist of Ridgway, Pa., was married to Miss Minnie C. Person, also of Ridgway, Dec. 4.—William S. Hallett, a dentist of Chambersburg, Pa., was married to Miss Olive White of Odessa, Del., Dec. 23.—William Meter, a dentist of Reading, Pa., was married to Miss Eleanor McDanel of New Brighton, Jan. 2.—J. E. Hoffman, a dentist of Cascade, Wis., was married to Miss Adella Habighorst of Sheboygan Falls, Dec. 3.—J. W. Reblitz, a dentist of Hustisford, Wis., was married to Miss Olga Roessler, also of Hustisford, Dec. 25.

AMALGAM DIE FOR INLAY WORK.—After securing a satisfactory impression the surplus metal tray should be cut away, leaving only that which is in direct contact with it; then a suitable quantity of plaster is mixed, of a consistence to stand when placed in the form of a cone on a glass or other suitable slab. The impression, metal side down, should be forced deeply enough into the plaster to leave a strong wall around it. After it is hard, trim the top to leave a depth sufficient for the amalgam which is to form the die; here is where many fail, and their failure is usually due to an effort to fill the impression as one would a cavity in a tooth—that is, by getting rid of the excess of mercury and burnishing with considerable pressure. This the compound will not stand, but it will stand a good even pressure over its entire surface, and if the amalgam be worked into place very soft, enough of the excess mercury can be removed by pressure upon the whole mass when the impression is completely filled; the result will be a very sharp, clear reproduction of the tooth cavity.—F. T. VAN WOERT, *Dental Cosmos*.

GOLD INLAY FOR FRACTURED INCISOR.—This method may be used where the incisal edge is broken off, or where the lingual surface has been cut away by opposing teeth. First grind incisal edge and lingual surface to allow for plenty of gold for occlusal wear. Next cut two dovetail cavities in the incisal edge, the same appearing on lingual surface as V-shaped openings. Then drill a pit in the lingual fossa. After the retaining points have been properly prepared, the inlay will have to go on from the end and no amount of stress will unseat it. Now take pure gold, forty gauge, and burnish over the lingual and incisal edge; take a gold plugger and punch holes through the backing into the pit and dovetail cavities and pack gold foil into these; this will give you gold foil pins instead of soldered platinum and a much better adaptation. After packing the gold foil you can complete your adaptation of the backing to the tooth without any danger of it moving. After thoroughly burnishing, remove backing, coat underside with whiting to keep solder from flowing through. Cut strips of twenty-two karat solder the size of incisal edge and sweat them on the backing, one at a time, until the cusp is the proper length. Place eighteen or twenty karat solder on lingual surface and flow until you get the proper occlusion. Place backing on the tooth occasionally during

the soldering and burnish so that your backing may be in perfect adaptation to your tooth, finish and set. Where the fracture is so extensive as to destroy the pulp, I use a step anchorage with iridio-platinum pins in root canal. The method may be used as an abutment for bridge.—Dr. W. S. WALLACE, *Dental Review*.

DENTAL CHART REVEALS ERROR IN IDENTIFICATION.—Except for the introduction of a dentist's chart and itemized bill, the unidentified young man who was cut in two by a Michigan Central freight train at the Visger Street crossing, River Rouge, would have been given a suitable burial as the son of Lawrence McMullin, of Detroit, and the family would have learned later that a total stranger had been interred as their son. However, the rough clothing worn by the dead man finally aroused a suspicion in the minds of some of the relatives. To prove the identity of the dead beyond a doubt a dentist who had done work for young McMullin was called in. With the aid of his itemized bill and a chart, showing work done, the dentist at once ascertained that the dead man was not McMullin. The funeral arrangements were immediately canceled.—*Detroit Tribune*.

METHOD OF TAKING PLASTER IMPRESSIONS IN PARTIAL CASES.—I take an impression without an impression cup. In doing this the first thing is to have the patient rinse the mouth with milk of magnesia. This lubricates the teeth and makes it possible for the plaster to get a close adaptation to the teeth, without sticking to them. If the plaster is mixed so that it will not drop off in chunks, but run off, you can keep on piling up until you have got sufficient surface, so that you will have as much bulk of plaster as you would in an impression cup. After the plaster has become hard it will not readily move out of place, but may easily be cut with a spatula. I slit it half way through in three or four places, and with a broad spatula placed in the full length of the slit, twist it out and spring it apart. The pieces may easily be placed together again after removal.—WILLIAM H. TAGGART, *Dental Review*.

APHONIA FOLLOWING ANESTHESIA.—A case of unusual occurrence has lately been reported to me, and which I think will be of interest to all dentists, because of peculiar circumstances connected with it. I am indebted to Dr. John A. Cavanaugh, 72 Madison street, a specialist on ear, nose and throat, for my information.

Name—Miss J. G., Chicago, Ill.

Age—Twenty-nine years. Occupation—Bookkeeper.

She was referred to a well-known dentist in the downtown district to have three teeth extracted. On Thursday, August 29th, she called at the dentist's office to have this work done. She was put to sleep with nitrous oxid by dentist. When she awoke she was nervous, excited and somewhat hysterical, and she says she did not recover from the shock for a number of days. On the following Sunday she lost her voice, and could not speak above a whisper. She consulted her physician, who said the loss of her voice was due to an overdose of the anesthetic. She treated with this physician for ten days or so, without any improvement. She was then

advised to consult a specialist, and called upon Dr. Cavanaugh for the purpose of getting proof that the overdose of anesthetic was the cause of her aphonia; if such was the case, she wished to recover damages. Doctor Cavanaugh assured her that the anesthetic had nothing to do with her condition, but there were other things present which were the probable causes.

I mention this case to show what condition might follow anesthesia and yet have no bearing on the anesthetic whatsoever.—DR. C. M. PADEN, Chicago, *American Dental Journal*.

POLISH YOUR AMALGAM FILLINGS.—The advisability of polishing amalgam fillings has been questioned, some operators preferring to leave the frosted effect produced by wiping the surface of the filling with wet spunk or cotton. While this frosted effect blends well with the tooth color at the time, afterward it becomes badly oxidized and assumes a dark, unsatisfactory appearance. The frosted effect is due to the accumulation of innumerable small, irregular particles of alloy on the surface of the filling; in consequence the surface is not perfectly smooth, and affords lodgment for minute particles of debris. As most of the alloys of to-day expand slightly upon setting, there is not a perfectly flush union left between the amalgam and the enamel wall; so if this edge is not polished and is allowed to remain, it will be an agency in the formation of the "black ditch" so frequently met with around fillings.—F. C. BRUSH, *Dental Brief*.

BOIL IT DOWN.—

When you've got a thing to say
Say it! Don't take half a day.
When your tale's got little in it
Crowd the whole thing in a minute!
Life is short—a fleeting vapor—
Don't you fill the whole blamed paper
With a tale which, at a pinch,
Could be cornered in an inch!
Boil her down until she simmers;
Polish her until she glimmers.
When you've got a thing to say
Say it! Don't take half a day!

—*Sunday School Times*.

WANTED!—SKILL IN DIAGNOSIS.—There is nothing of more practical consequence for our success as practitioners and for the well-being of our patients than that we get at the real causative factors of any pathologic condition that may influence the health of related regions, or of the whole system. The more proficient one becomes in recognizing pathologic expressions in the region with which the dentist is most intimately concerned, the more will one realize that the oral cavity, the nasal cavity, the pharyngeal cavity, and the organs of hearing and seeing, are intimately related to each other, and that it is of much consequence that one have some knowledge not only of

the particular specialty which he may practice, but also of the intimately related contiguous regions. Everywhere throughout the country there are instances of specialists treating manifestations that have their origin in organs outside of their own specialty. There should be an intelligent understanding of all these relations, and no man should undertake the practice of a specialty like ours without having some general knowledge of pathology. No man should proceed with the treatment, and certainly not with the sacrifice of an anterior tooth, until he is satisfied that there is not a tooth posterior to it that might be the real mischief-maker. No man is qualified to treat a pain in the temporal region, or in the region of the ear, unless he be familiar with the pathology of the third molar. So I feel very earnestly that in these matters there is wanted a pathologic sense, a broad view that shall take into account all outside influencing factors.—C. A. BRACKETT, *Dental Cosmos*.

CARBON DIOXID AN ANTISEPTIC.—A new method of preserving milk in closed vessels for an indefinite period has been perfected by an inventor of London. The process consists in eliminating the air and replacing it by carbon dioxid. Professor Macfayden, the bacteriologist, has asserted that if all the microorganisms could be excluded, milk would never go sour, and, by aeration, this claim has been substantiated. Carbon dioxid possesses decided antiseptic qualities, and is harmless when consumed with food. In this manner milk can be stored in bottles or other similarly sealed vessels for a prolonged period without souring, as experiments have demonstrated. Similarly, owing to the antiseptic properties of the gas, aeration completes sterilization carried out by the dairyman. In the case of those who do not like the flavor of aerated drinks, the milk can be easily stilled by pouring it into an open vessel, such as a glass or jug, and leaving it exposed to the air for a short time.—*Scientific American*.

IMAGINATION AND TEETH: AN ANESTHETIC FAILED, BUT THE PATIENT FELT NO PAIN.—Writing to a London paper, a medical man tells this story: "A remarkable incident happened recently at a London dental hospital. A young woman went there to have five teeth extracted. The anesthetic decided upon by the dental surgeon was ethyl chlorid, and this was administered by the usual form of apparatus. An india rubber cap is placed over the patient's mouth and nostrils, and connected with it is a bag into which a sealed capsule of ethyl chlorid is introduced. By the turning of a screw from the outside the capsule is broken and the anesthetic liberated. The screw was turned, the patient went off gradually into the usual condition of insensibility, five teeth were extracted, and the patient awakened without feeling any part of the operation. The whole case appeared perfectly normal. Only when the young woman had left the room and the apparatus was being made ready for another patient was it discovered that the capsule of ethyl chlorid had by some mischance not been broken at all. The whole condition of insensibility had been brought about by the self-hypnotism of the patient. The idea that an anesthetic was being administered was so strong in her mind that she had passed into insensibility entirely by hypnotic suggestion."